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ILLUSTRATIONS
OF THE
LAND AND FRESH WATER
CONCHOLGY

OF
GREAT BRITAIN AND IRELAND,

WITH
FIGURES, DESCRIPTIONS, AND LOCALITIES
OF ALL THE SPECIES.

DRAWN AND COLOURED FROM NATURE

BY CAPTAIN THOMAS BROWN, M.P.S.,

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ETC., ETC., ETC.

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TO

ROBERT MANN, ESQ.,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS,

&c., &c., &c.,

THE FOLLOWING WORK IS INSCRIBED,

AS A MARK OF ESTEEM FOR HIS PROFESSIONAL SKILL,

AND UNWEARIED ZEAL IN THE PROMOTION OF NATURAL HISTORY,

AND IN TESTIMONY OF REGARD FOR AN UNINTERRUPTED

FRIENDSHIP OF MANY YEARS,

BY THE

AUTHOR.

MUSEUM, MANCHESTER,

FEBRUARY, 1845.

P R E F A C E.

THE following Treatise is intended as a Manual to Conchologists residing at a distance from the coast, and whose personal opportunities of collecting are consequently limited to our Land and Fresh Water Shells, now ascertained to be pretty numerous in species since the time of Colonel Montagu, and my distinguished friend Dr. Leach, whose decease, in the prime of life, was a heavy loss to science. Among those that have materially extended the number of species may be particularised, J. G. Jeffreys, Esq., Swansea; Professor Forbes, King's College, London; Joshua Alder, Esq., Newcastle-upon-Tyne; and the Rev. Leonard Jenyns. For an extensive acquaintance with the Irish species, I am indebted to William Thompson, Esq., Belfast; Robert Ball, Esq., Miss Mary Ball, and T. W. Warren, Esq., of Dublin. To the Rev. J. B. Clarke, of Tuam, I am under a deep obligation for the use of his beautiful and correct delineations of the Limacidæ figured in plates 25 and 26.

I have endeavoured to render the Work as complete as possible, by illustrations of all the authenticated species, as well as of many varieties. These have been represented in different positions, so as to convey the most perfect idea of the form of the species; amounting to upwards of three hundred and thirty figures. Having collected specimens of the beautiful genus *Anodon* from distant and wide-spread localities, I have been enabled

to exhibit twelve distinct and permanent varieties of *Anodon Cygneus*, and there can be little doubt but more may yet be ascertained, by a careful comparison of specimens from numerous waters.

Almost every situation in the British Islands has its Land and Fresh Water Shells. Lakes, Rivers, Canals, Ponds, and Ditches abound with the *Lymnaeidae*, *Valvatidae*, *Cycladidae*, and *Unionidae*; some of which lurk in the mud at the bottom, or crawl upon aquatic plants; while those of the Land localise in extremely varied situations; the *Helicidae* and *Limacidae* frequent the bottoms of hedge-rows, gardens, woods, and meadows, under stones, amongst nettles and other plants, while the *Pupidae*, *Clausiliidae*, and their congeners inhabit mossy banks, old walls, the bark of decayed trees, and other dry places.

I have rejected all the species not indigenous to the British Islands, with the exception of *Dreissina polymorpha*, which, although an alien, has become a numerous and prolific inhabitant of most of our Canals.

In the choice of specific names, I have for the most part adopted those of Colonel Montagu, whose work is entitled to the highest praise, from the clearness and simplicity of its descriptions of species; many of which were given prior to those of Continental writers on this branch of science; whose specific names I have given in the numerous synonyms.

I have added to the illustrations, figures of an animal of nearly each genus, with short descriptions of their Generic Characters in an appendix, which I thought preferable to mixing them up in the text.

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CLASS I.
MOLLUSCA GASTEROPODA.
ORDER TRACHELIPODA.

Animals provided with gills for breathing fresh water.

FAMILY I.—NERITACEA.

The species of this family are inhabitants of both fresh water and the ocean. Their form is semiglobular, or oval; destitute of a columella; with aperture marginated, and transverse; always provided with an operculum.

GENUS I.—NERITINA.—Lamarck.

Shell thin, external surface generally smooth, and frequently covered with a strong, horny epidermis; spire mostly very short, sometimes nearly concealed, and at others obsolete; aperture semicircular; outer lip plain, sharp, and destitute of teeth or crenulations internally, but within the lower region of the aperture, it is provided with a somewhat elongated, transverse prominence, which seems the fulcrum for the articulation of the operculum; inner lip flattened, and reflected on the columella, and placed obliquely to the axis of the shell; edge generally short, and dentated or crenulated; as the animal increases in dimensions, that part of the columellar lip is absorbed, which makes it appear as having no columella; operculum testaceous, semicircular, closing the aperture entirely, covered with a horny epidermis, and provided internally at the lower end with a tooth-like appendage, which fits into a hollow between the prominence and lip.

1. NERITINA FLUVIATILIS, pl. I, f. 1, 2, 3.

Neritina fluviatilis, Turton, Man., p. 13, f. 124; Alder, Mag. Zool. and Bot., II, p. 117; Thompson, Ann. and Mag. Nat.

Hist., VI, p. 16; Lamarck, An. San. Vert., VI, pt. 2nd, p. 188; Fleming, Brit. An., p. 321; Brown, Illustrations Conch. Great Britain and Ireland, p. 26, pl. 13, f. 45; *Nerita fluviatilis*, Müller, Moll., II, p. 194; Drapernaud, Hist. Moll., p. 31, pl. 1, f. 1; Pfeiffer, I, p. 106, f. 37, 38, 39; Fleming, Edin. Ency., VII, p. 82; Ib., Brit. An., p. 321; Brard, p. 194, pl. 7, f. 9, 10, 12; Brown, Wernerian Mem., II, p. 552; Turton, Conch. Dic., p. 127; *Neritina fontinalis*, Brard, Hist. Conch., p. 196, pl. 7, f. 11; *Theodoxus Lutetianus*, De Montford, II, p. 351; Da Costa, Brit. Conch., p. 48, pl. 3, f. 8; Pennant, Brit. Zool., IV, p. 141, pl. 88, f. 142; Donovan, Brit. Sh., I, pl. 16, f. 2; Montagu, Test. Brit., p. 470.

Shell suboval, subpellucid; body very large; spire extremely small, oblique, and lateral, consisting of two well defined volutions, and terminating in a minutely small, slightly produced apex; aperture luniform; outer lip thin, sharp at the edge; pillar lip white, flat, and very broadly reflected on the columella; aperture closed by a testaceous operculum, of an orange-yellow colour; whole shell covered with a brown or greenish epidermis, beneath which the surface is glossy and smooth, but longitudinal, minute wrinkles, are observable by the aid of a strong lens; beautifully streaked, spotted, or mottled; with white and purplish-brown, deep umber, or pale brown, and in some instances with spiral bands of either of those colours. Length three-eighths of an inch; breadth a quarter of an inch.

Fig. 3 represents the operculum.

Found in many of the slow running rivers and streams of Great Britain and Ireland adhering to stones, as the Thames, Humber, Tyne, and Tweed in England; the Liffey, in Lough Derg, and near Banacher, in the Shannon, and in some of the tributaries of that river, in the County of Tipperary, and Bresna in Ireland, the Grand Canal, near Clonooney, and also near Dublin; and the Forth, Tay, and Clyde in Scotland.

FAMILY II.—PERISTOMIDA.

Shell conoid, or subdiscoid, with the margins of the aperture united; aperture protected by an operculum; fluviatile, and the animal having the power of respiring in water.



GENUS II.—PALUDINA.—Lamarck.

Shell ovate, or oblong; spire somewhat turreted; the volutions smooth, rounded, and subcarinated; aperture subrotund, ovate, or oblong, a little angulated above, slightly modified on the inner side by the gibbosity of the body volution; lips united all round, with acute edges; operculum corneus, with concentric lines of growth, and provided with a sublateral nucleus.

1. *PALUDINA VIVIPARA*, pl. I, f. 4, 5.

Paludina vivipara, Lamarck, An. San. Vert., VI, pt. 2nd, p. 173; Brard, Coq. de Paris, p. 174, pl. 7, f. 1; Fleming, Brit. An., p. 315; Alder, Mag. Zool. and Bot., II, p. 116; Thompson, Ann. and Mag. Nat. Hist., p. 17; Brown, Illust. Conch., p. 26, pl. 14, f. 71, 72; *Cyclostoma viviparum*, Drapernaud, Hist. Nat. des Moll., p. 34, pl. 1, f. 16, 17; Turton, Man., p. 113, f. 118; Brard, Coq. de Paris, p. 174, pl. 7, f. 1; Ross-massler, f. 66; *Helix vivipara*, Montagu, Test. Brit., p. 386; Brown, Wernerian Mem., II, p. 527; *Viviparus fluviorum*, De Montford, II, p. 247; *Paludina achatina*, Sowerby, Gen., f. 1.

Shell thin, subconic, oblong-ovate; spire consisting of five extremely ventricose, abruptly diminishing volutions, separated by a deep suture, and terminating in an acute apex; aperture suborbicular, a little contracted above; pillar lip slightly reflected, behind which is a subumbilicus; inside smooth, bluish-white, the external bands shining through; whole shell covered with an olive-green shining epidermis, beneath which the shell is white, with three spiral, dark brown bands on the body, and two on the superior volutions, which generally grow fainter as they ascend, until they become nearly invisible before reaching the apex; surface slightly wrinkled longitudinally, several of which are coarser than the others, marking the periodical growth of the shell; aperture protected by a thin horny operculum.

In the young condition the shell is subglobose, subpellucid, with the bands rather obscure, and the volutions appear more flattened above than in the adult state.

Found in the Thames and other slow rivers, and sometimes in ponds. Plentiful in a ditch near Southport, Lancashire. Occurs in a stream at Newtownards, County of Down, Ireland.

2. *PALUDINA ACHATINA*, pl. I, f. 6, 7.

Paludina achatina, Lamarck, An. San. Vert., VI, pt. 2nd, p. 174; Ency. Meth., pl. 458, f. 1, *a, b*; Rossmassler, p. 109, f. 66*; Turton, Man., p. 133, f. 119; Brown, Illust. Conch., p. 26, pl. 14, f. 68, 69; *Lymnea vivipara*, Fleming, Brit. An., p. 315; *Cyclostoma achatina*, Drapernaud, p. 36, pl. 1, f. 18.

Shell thin, oblong-ovate, ventricose; spire consisting of four or five considerably inflated volutions, separated by a well defined, deep suture, and terminating in a rather obtuse apex; aperture suborbicular, slightly contracted above, white within, with the external bands apparent; pillar lip a little reflected on the columella; outer lip thin, and sharp on the edge; whole shell covered with an olivaceous epidermis, beneath which it is provided with three, dark reddish brown, spiral girdles on the body, and two on the superior volutions; surface with a few obsolete wrinkles, or lines of growth; aperture provided with a thin, elastic, horny operculum.

Found in the canal at Birmingham, where it has hitherto been mistaken for the *P. vivipara*.

This species may be distinguished from the *P. vivipara* by the volutions being less inflated, in the suture being less deep, the spire tapering less abruptly, and more obtuse at the apex; and in the whole shell being more cylindrical.

3. *PALUDINA IMPURA*, pl. I, f. 8, 9.

Paludina impura, Lamarck, An. San. Vert., VI, pt. 2nd, p. 175; Brard, Coq. de Paris, p. 183, pl. 7, f. 2; Drapernaud, Moll., p. 36, pl. 1, f. 19; Pfeiffer, p. 104, pl. 4, f. 40; Brown, Illust. Conch., p. 27, pl. 14, f. 72, 73; Turton, Man., p. 134, f. 120; Alder, Mag. Zool. and Bot., II, p. 116; *Paludina tentaculata*, Fleming, Brit. An., p. 315; Thompson, Ann. and Mag. Nat. Hist., VI, p. 17; *Helix tentaculata*, Donovan, Brit. Sh., III, pl. 93; Pennant, Brit. Zool., IV, p. 140, pl. 86, f. 140; Montagu, Test. Brit., p. 389; Brown. Wernerian Mem., II, p. 531.

Shell oblong-oval, thin, smooth, semitransparent; spire consisting of four or five ventricose volutions, deeply divided by the suture, and terminating in an acute apex; aperture suborbicular, pointed above, and closed by a testaceous, concentrically wrinkled, operculum, which is internally coated with a testaceous covering, and its nucleus subcentral; outer lip smooth on the

edge, moderately strong, with a slightly raised internal rib; inner lip a little reflected on the columella; external surface smooth, and of a yellowish horn colour. Length half an inch; diameter three-eighths.

This is a very common shell, inhabiting most slow rivers, streams, and stagnant waters.

Drapernaud, pl. 1, f. 20, figures a variety of this species which is less, shorter, and more conical.

4. **PALUDINA VENTRICOSA**, pl. I, f. 10, 11.

Paludina ventricosa, Leach, MSS.; Brown, Illust. Conch., p. 27, pl. 14, f. 74, 75; *Paludina acuta*, Fleming, Brit. An., p. 315; *Paludina similis*, Turton, Man., p. 135, f. 121; Alder, Mag. Zool. and Bot., II, p. 116; *Turbo Leachii*, Sheppard, Linn. Trans., XIV, p. 152; *Cyclostoma simile*, Drapernaud, Hist. des Moll., p. 31, pl. 4, f. 15? *Bithinia ventricosa*, Gray, Med. Rep., 1821, p. 239.

Shell oblong-ovate, conic, smooth, semitransparent, of a yellowish horn colour; body large, tumid; spire abruptly tapering, and consisting of four much inflated volutions, deeply divided by the suture, and terminating in a sharp apex; aperture nearly orbicular, somewhat outwardly produced; outer lip sharp-edged; pillar lip slightly reflected on the columella, with a small, oblique, subumbilicus behind; aperture protected by a testaceous operculum. Length a quarter of an inch; breadth two lines.

In some specimens the body volution is slightly decussated, the spiral striæ being somewhat more obvious than the longitudinal.

Found in ditches at Battersea, near the Thames; and other places in the south of England.

GENUS III.—ASSIMINIA.—Leach.

Shell somewhat oval, light, solid, covered with a horny epidermis; spire produced into an acute pyramid; volutions slightly angulated in the centre, rounded beneath; aperture elliptical, somewhat modified by the body volution; inner lip plain; columella imperforate; outer lip thin.

It is difficult to distinguish the shells of this genus from those of *Littorina*.

1. ASSIMINIA GRAYANA, pl. I, f. 12, 13.

Assiminia Grayana, Leach, MSS.; Fleming, Brit. An., p. 275; Berkeley, Zool. Journ., V, p. 429, pl. 19, f. 4; Alder, Mag. Zool. and Bot., II, p. 116; Brown, Illust. Conch., p. 27, pl. 18, f. 3, 4; *Nerita syncera hepatica*, Gray, Med. Rep., 1821, p. 239; *Paludina Grayana*, Potiez, Gal., I, p. 251, pl. 25, f. 23, 24; *Lymneus Grayanus*, Jeffreys, Linn. Trans., XVI, p. 378.

Shell ovate, smooth, shining, dark reddish horn-colour, or ferruginous; body large; spire small, consisting of three or four abruptly tapering volutions, slightly divided by a nearly transverse suture, and terminating in a somewhat acute apex; aperture ovate, slightly contracted at both extremities; outer lip thin, even; inner lip smooth, a little reflected on the columella; provided with an ovate, horny, blackish-brown operculum. Length a quarter of an inch; breadth a little more than half its length.

Inhabits the Thames and other rivers, and small streams connected with them, seldom beyond the point where the water is brackish.

GENUS IV.—VALVATA.—Müller.

Shell discoid, or conoid, with rounded, close-set, or depressed volutions; covered by an olive-coloured epidermis; aperture circular, not modified by the body; peritreme acute, sharp-edged, and continuous; provided with a horny, orbicular operculum, consisting of numerous gradually increasing volutions, having an acute membranous margin, which forms a spiral elevation on the external surface.

1. VALVATA PISCINALIS, pl. I, f. 14, 15.

Valvata piscinalis, Lamarck, An. San. Vert., VI, pt. 2nd, p. 172; Alder, Mag. Zool. and Bot., II, p. 116; Kenyon, Mag. Nat. Hist., III, p. 425, f. b, c, d; Fleming, Brit. An., p. 286; Forbes, Mal. Mon., p. 20; Thompson, Ann. and Mag. Nat. Hist., VI, p. 17; Brown, Illust. Conch., p. 27, pl. 14, f. 62, 63, 64, 65; *Valvata depressa*, Pfeiffer, Syst., p. 100, pl. 4, f. 33; *Valvata obtusa*, Turton, Man., p. 130, f. 114; Brard, Coq. de Paris, p. 190, pl. 6, f. 17; *Cyclostoma obtusum*, Drapernaud, p.

33, pl. 1, f. 14; *Turbo fontinalis*, Montagu, Test. Brit., p. 348, pl. 22, f. 4; Brown, Wernerian Mem., II, p. 522; *Lymnea fontinalis*, Fleming, Edin. Ency., VII, p. 78; *Turbo thermalis*, Dillwyn, p. 852.

Shell thin, subpellucid, horn-coloured, smooth, with fine spiral striæ throughout, and a few obscure, concentric lines of growth; length and breadth nearly equal; body very large, much inflated, with a deep central umbilicus at its base; spire small, short, consisting of four tumid, deeply defined volutions; aperture orbicular; peristome thin, the inner lip slightly attached to the body volution. Length little more than a quarter of an inch.

Common in rivers, canals, ponds, and lakes in Britain, and in ditches in the Curraghs, Isle of Man.

Fig. 16, 17, pl. I, is a permanent variety, with the spire more produced, and the volutions somewhat scalariform; found at Clonoony, King's County, Ireland. Mr. Thompson mentions a variety found by Edward Waller, Esq., at Finnoe, County of Tipperary, the volutions of which appear angular from being spirally cut.

2. VALVATA CRISTATA, pl. I, f. 18, 19.

Valvata cristata, Müller, Verm., p. 198; Fleming, Brit. An., p. 286; Alder, Mag. Zool. and Bot., II, p. 116; Thompson, Ann. and Mag. Nat. Hist., VI, p. 18; Brown, Illust. Conch., p. 28, pl. 14, f. 66, 67; *Valvata spirorbis*, Drapernaud, p. 41, pl. 1, f. 32, 33; Turton, Man., p. 131, f. 115; Brard, p. 187, pl. 6, f. 15, 16; *Turbo cristatus*, Maton and Racket, Linn. Tr., VIII, p. 169; Brown, Wernerian Mem., II, p. 522; *Helix cristata*, Montagu, Test. Brit., p. 460, pl. 1, f. 7, 8.

Pl. I, f. 20, represents the young shell, *Valvata minuta*, of Drapernaud, pl. 1, f. 36, 37, 38; Turton, Man., p. 132, f. 117.

Shell discoidal, consisting of four cylindrical volutions, flattened above, and umbilicate beneath; exposing nearly all the inner volutions, these are slightly striated transversely; aperture quite orbicular, attached to but not interrupted by the body volution; peristome as thick as the other parts of the shell, and slightly oblique. Diameter one-tenth of an inch.

Found in canals and ditches in Britain, and is a very common species in almost all parts of Ireland.

FAMILY III.—LYMNÆEA.

Shell spiral, generally with a smooth external surface; margin of the outer lip always acute, and not reflected. Animals amphibious, usually destitute of an operculum.

GENUS V.—LYMNÆA.—Lamarck.

Shell oblong, thin, sometimes elongated and acutely turrited; spire always produced; aperture large, entire, oblong, generally straitened, and somewhat acuminate above and rounded below; outer lip acute; the lower part of the inner lip ascending on the pillar, forming an oblique plait or fold, and rising, spreads more or less over the columella, or front of the body volution; external surface smooth, frequently polished. Destitute of an operculum.

1. LYMNÆA STAGNALIS, pl. I, f. 21, 22.

Lymnaeus stagnalis, Lamarck, An. San. Vert., VI, pt. 2nd, p. 159; Drapernaud, p. 51, pl. 2, f. 38, 39; Pfeiffer, p. 86, pl. 4, f. 19; Turton, Man., p. 121, f. 104; Alder, Mag. Zool. and Bot., p. 114; Brard, p. 133, pl. 5, f. 1; De Montfort, II, p. 268; Sowerby, Genera, f. 1; Rossmassler, I, p. 95, pl. 2, f. 49; Thompson, Ann. and Mag. Nat. Hist., VI, p. 45; Brown, Illust. Conch., p. 28, pl. 15, f. 18, 19, 21, 22, 23; *Stagnicola vulgaris*, Leach, Moll., p. 145; *Lymneus major*, Jeffreys, Linn. Tr., XVI, p. 375; *Limnea stagnalis*, Fleming, Brit. An., p. 273; *Helix stagnalis*, Montagu, Test. Brit., p. 367, pl. 16, f. 8; Donovan, Brit. Sh., II, pl. 51, f. 2; Brown, Wernerian Mem., II, p. 530.

Shell very thin, brittle, oblong-oval, subulate, pellucid, and horn-coloured; body large, longitudinally striated, generally crossed by a few raised spiral ridges; spire acute, consisting of five or six volutions, tapering to a fine point, and separated by a deep suture; aperture oval, a little narrower above than below, and occupying more than half the length of the shell; outer lip thin, but not reflected; pillar lip reflected on the columella, with an oblique fold, behind which is a slight umbilicus.

This shell is subject to some variety. Fig. 23, 24, pl. I, is a thin and less ventricose variety, to which Montagu gives the specific name of *fragilis*, p. 369, pl. 16, f. 7.

Fig. 25, pl. I, is the representation of a young shell.

The very fine specimen from which f. 21 and 22 were drawn, I obtained in a small stream on a flat meadow near Clonooney Barracks, King's County, Ireland, where they were plentiful of that size.

2. *Lymnæa palustris*, pl. II, f. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

Lymnæus palustris, Lamarck, An. San. Vert., VI, pt. 2nd, p. 160; Drapernaud, p. 52, pl. 2, f. 40 and 42; Pfeiffer, p. 80, pl. 4, f. 20; Turton, Man., p. 123, f. 107; Rossmassler, Icon., I, p. 96, f. 51, 52; Brard, p. 136, pl. 5, f. 6, 7; Alder, Mag. Zool. and Bot., II, p. 114; Thompson, Ann. and Mag. Nat. Hist., VI, p. 45; Forbes, Mal. Mon., p. 14; Brown, Illust. Conch., p. 28, pl. 15, f. 4, 5, 7, 14, 15, 16, 17, 18, and 23; *Lymnæus communis*, Jeffreys, Linn. Tr., XVI, p. 276; *Stagnicola communis*, Leach, Moll., p. 142; *Limnea palustris*, Fleming, Brit. An., p. 274; *Helix palustris*, Montagu, Test. Brit., p. 373, pl. 16, f. 10; Donovan, Brit. Sh., pl. 175; Brown, Wernerian Mem., II, p. 530; *Helix stagnalis*, Pennant, Brit. Zool., IV, p. 86, pl. 13, f. 13.

Shell oblong-ovate, subpellucid, brownish horn-coloured; body subcylindrical; spire consisting of four or five well defined, slightly rounded volutions, terminating in a sharp apex, slightly wrinkled longitudinally, and sometimes traversed by distant, slight, irregular transverse ridges, particularly on the body volution, producing a faceted appearance; aperture oval, occupying nearly the half of the shell, inside frequently of a deep chocolate, or purplish-brown; outer lip thin; inner lip a little reflected on the columella, with a small umbilicus behind. Length generally about three-quarters of an inch; breadth three-eighths. It sometimes, however, occurs larger.

This species is subject to great variety, both in proportions and colour. Fig. 3, 4, 5, 6, 7, 8, 9, 10 are varieties; f. 5 is a variety of a deep blackish-brown, and is variety *b* of Drapernaud, p. 52, pl. 2, f. 42; Maton and Racket, Linn. Tr., VIII, pl. 5, f. 8; f. 8 is variety *c* of the same author, pl. 2, f. 42; f. 3, 4 is a variety, with the apex decollated, which is not uncommon, Mag. Nat. Hist., VII, p. 161, f. 32.

Found plentifully in ditches, marshes, lakes, and ponds.

3. *Lymnæa minuta*, pl. I, f. 26, 27.

Limneus minutus, Drapernaud, p. 53, pl. 3, f. 5, 6; Alder, Mag. Zool. and Bot., II, p. 115; Brard, p. 138, pl. 5, f. 8, 9;

Limneus fossarius, Turton, Man., p. 124, f. 108; *Limneus minutus*, Brard, p. 138, pl. 5, f. 8, 9; *Limneus truncatulus*, Jeffreys, Linn. Tr., XVI, p. 377; Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; *Lymnaea minuta*, Lamarck, VI, pt. 2nd, p. 162; Brown, Illust. Conch., p. 28, pl. 15, f. 12, 13; *Lymnaea fossaria*, Fleming, Brit. An., p. 274; *Helix fossaria*, Montagu, Test. Brit., p. 372, pl. 16, f. 9; Brown, Ency. Brit., VI, p. 401; Ib., Wernerian Mem., II, p. 530; *Turbo rivulus*, Walker, Test. Min. Rar., f. 57.

Shell oblong-ovate, pellucid, of a yellowish horn colour; spire consisting of five or six rounded, and deeply defined volutions, terminating in a sharp apex; aperture ovate, nearly half the length of the shell; outer lip slightly reflected; inner lip narrowly folded on the columella. Length generally half an inch, but frequently less.

This species is not uncommon in many parts of Britain and Ireland. It frequents muddy drains or ditches, and is often to be found in situations, out of water, existing merely by a little moisture.

4. LYMNÆA ELONGATA, pl. III, f. 1, 2, 3, 4.

Limneus elongatus, Drapernaud, p. 52, pl. 3, f. 3, 4; Turton, Man., p. 122, f. 106; Alder, Mag. Zool. and Bot., II, p. 115; Brown, Illust. Conch., p. 29, pl. 15, f. 1, 2, 3, and 5; *Lymnaea leucostoma*, Lamarck, An. San. Vert., VI, pt. 2nd, p. 162; *Lymnaeus elongatus*, Rossmassler, Icon., I, p. 101, pl. 2, f. 58; *Linnea elongata*, Sowerby, Genera, f. 6; *Limneus glaber*, Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; *Helix octanfracta*, Montagu, Test. Brit., p. 396 and 588, pl. 11, f. 8; Brown, Ency. Brit., VI, p. 461; *Helix octona*, Pennant, Brit. Zool., IV, p. 138, pl. 8, f. 139; *Helix perigrina*, Dillwyn, Des. Cat., p. 954; *Stagnicola octanfracta*, Leach, Moll., p. 141.

Shell horn-coloured, smooth, pellucid, greatly elongated; body not half the length of the shell; spire long, tapering, consisting of seven or eight slender, gradually diminishing, somewhat cylindrical volutions, terminating in an acute apex, these are very slightly wrinkled longitudinally, and the lower volutions sometimes obscurely striated transversely; aperture oblong, not a third the length of the spire; outer lip thin; inner lip white, and slightly reflected on the columella.

This species is subject to variety, both in size and form, as will be seen by a reference to our figures; in some the spire terminates in a decollated apex. It also varies in the number of its volutions.

Section II.—Subovate; body ventricose; aperture longer than the spire.

5. *LYMNÆA AURICULARIA*, pl. II, f. 11, 12, 13, 14.

Lynnæa auricularia, Lamarck, An. San. Vert., VI, pt. 2nd, p. 161; Brown, Illust. Conch., p. 29, pl. 15, f. 29, 30, 31, 32; *Limneus auricularis*, Brard, p. 140, pl. 5, f. 2; Turton, Man., p. 117, f. 100; *Limnæus auricularis*, Pfeiffer, p. 85, pl. 4, f. 17, 18; *Limneus auricularis*, Drapermaud, p. 49, pl. 2, f. 28, 29, and 32; Rossmassler, Icon., I, p. 98, pl. 2, f. 55; Jeffreys, Linn. Tr., XVI, p. 372; Alder, Mag. Zool. and Bot., II, p. 115; Thompson, Ann. and Mag. Nat. Hist., VI, p. 29; *Helix auricularia*, Linnaeus, Syst. Nat., p. 1250; Pennant, Brit. Zool., IV, p. 138; Donovan, Brit. Sh., pl. 51, f. 1; Montagu, Test. Brit., p. 375, pl. 16, f. 2, and p. 381, pl. 16, f. 1; *Helix limosa*, Fleming, Brit. An., p. 275; Brown, Wernerian Mem., II, p. 531; Ib., Ency. Brit., VI, p. 461; *Radix auriculatus*, De Montfort, II, p. 207; *Gulnaria auricularia*, Leach, Moll., p. 148; *Buccinum auricula*, Müller, Verm., II, p. 126.

Shell slightly ovate, thin, brittle, subpellucid, of a pale yellowish horn colour; body very large, ventricose, and slightly wrinkled longitudinally; spire very short, consisting of three or four well defined volutions, terminating in an acute apex; aperture oblong-ovate, extremely wide, and large; outer lip greatly extended, and somewhat reflected at the margin; pillar lip smooth, broadly reflected on the columella, with a strong fold towards its lower part, and forming a slight umbilicus behind.

Found in the river Avon, the Kennet, Berkshire; and in a ditch at Clonooney, King's County, Ireland.

6. *LYMNÆA PEREGRINA*, pl. II, f. 15, 16, 17, 18, 19, 20, 21, 22, 23.

Limnæa peregra, Lamarck, An. San. Vert., VI, pt. 2nd, p. 161; *Limnæus pereger*, Pfeiffer, p. 90, pl. 4, f. 23, 24; Brown, Illust. Conch., p. 29, pl. 15, f. 8, 9, 10, 11, 36, 38, 39, 40; *Limneus pereger*, Drapermaud, p. 50, pl. 2, f. 34 and 37;

Turton, Man., p. 118, f. 101; Jeffreys, Linn. Tr., XVI, p. 374; Alder, Mag. Zool. and Bot., II, p. 115; Thompson, Ann. and Mag. Nat. Hist., VI, p. 44; *Lymnaea putris*, Fleming, Edin. Ency., VII, p. 77; *Lymnaea limosa*, Fleming, Brit. An., p. 274; *Helix peregra*, Gmelin, Linn. Syst. Nat., p. 3659; Montagu, Test. Brit., p. 373, pl. 16, f. 3; *Helix putris*, Pennant, Brit. Zool., pl. 86, f. 137; Brown, Wernerian Mem., II, p. 530; Ib., Ency. Brit., VI, p. 461; *Helix limosa*, Brown, Wernerian Mem., II, p. 530; *Buccinum peregrinum*, Müller, Verm., II, p. 134; *Gulnaria peregera*, Leach, Moll., p. 146.

Variety 1. *Ovate, aperture more dilated*, pl. II, f. 20, 21, 22, 23.

Lymnaea ovata, Lamarck, VI, II, p. 121; Kenyon, Mag. Nat. Hist., II, p. 425, f. g; *Lymnaeus ovatus*, Pfeiffer, p. 89, pl. 4, f. 21; *Limneus ovatus*, Drapernaud, p. 50, pl. 2, f. 30, 31; *Lymneus ovatus*, Brard, p. 142, pl. 5, f. 4, 5; *Lymnaeus ovatus*, Rossmassler, Icon., I, p. 100, pl. 2, f. 56; *Limnea lineata*, Bean, Mag. Nat. Hist., VII, p. 493, f. 62.

Variety 2. *Outer lip expanded, and with an internal rib*, pl. II, f. 17.

Helix auricularia, var., Maton and Racket, Linn. Tr., VIII, p. 218, pl. 5, f. 8*; *Lymnea marginata*, Michaud, Compl., p. 88, pl. 16, f. 15, 16.

Variety 3. *Shell small, stronger; spire but slightly produced; the outer lip not attenuated*, pl. II, f. 24, 25.

Helix lutea, Montagu, Test. Brit., p. 380, pl. 16, f. 6; Maton and Racket, Linn. Tr., VIII, p. 222.

Variety 4. *Spire acute, and tapering.*

Lymneus acutus, Jeffreys, Linn. Tr., XVI, p. 373.

Variety 5. *With the volutions reversed.*

Limnea lineata, Bean, l. c.; Sturm, pl. 39.

Shell ovate, thin, subpellucid, yellowish horn-coloured, slightly wrinkled longitudinally; body very tumid, and large; spire very short, consisting of three or four rapidly decreasing volutions, terminating in a sharp apex; aperture very large, oval, about three-fourths the length of the shell; outer lip thin; inner lip broadly reflected on the columella.

This species is subject to considerable variety, both in form and size; and is plentifully diffused in almost all ditches, ponds, and lakes, throughout Britain and Ireland.

We found variety 1, of the large size, figured in pl. II, f. 20, 21, 22, 23, in ditches at Bury, Lancashire.

7. *LYMNÆA INVOLUTA*, pl. II, f. 27.

Limneus involutus, Harvey; Alder, Mag. Zool. and Bot., II, p. 115; Ann. Nat. Hist., March, 1840, p. 22; Thompson, Ann. and Mag. Nat. Hist., VI, p. 45; Brown, Illust. Conch., p. 29, pl. 18, f. 5.

Shell very thin, pellucid, shining, rendering the columella visible throughout its whole length; colour, pale amber; body very large, enveloping the spire, and provided with coarse, longitudinal striae; spire very short, sunk, truncated at the apex, and sometimes concave, consisting of three volutions, none of which are visible in the profile of the shell; aperture very large, wide at the base, and extending to the apex; margin reflected only where it joins the pillar. Length five lines and a half; breadth three lines and a half.

Its general aspect is not unlike *Akera flexilis*, in consequence of the aperture extending to the apex, and the appearance of the columella.

This interesting and new species was discovered by William Henry Harvey, Esq., of Limerick, in a small alpine lake on the mountain of Cromaglaun, near the lakes of Killarney, Ireland. In his cabinet, and those of William Thompson, Esq., Mr. Hyndman, and Dr. Drummond of Belfast, and Robert Ball, Esq., Dublin.

GENUS VI.—AMPHIPEPLEA.—Nilson.

Shell subovate, nearly globular, very thin, membranaceous, and flexible; body extremely large; spire very small, and subacute; outer lip not continuous, slightly inflated above, and acute at the base; pillar lip provided with a single plait, or twist, and a little reflected on the base of the columella.

1. *AMPHIPEPLEA GLUTINOSA*, pl. III, f. 7, 8.

Amphipeplea glutinosa, Nilson, Moll. Sacc., p. 58; Rossmassler, Icon., I, p. 93, pl. 2, f. 48; *Limneus glutinosus*, Drapernaud, p. 50; Turton, Man., p. 120, f. 103; Michaud, pl. 10, f. 13, 14; Alder, Mag. Zool. and Bot., p. 115; Fleming, Brit. An., p. 275; *Limneus glutinosus*, Jeffreys, Linn. Tr., XVI, p. 371; *Limnea glutinosa*, Sowerby, Genera, f. 5; *Lymnaea glutinosa*, Brown,

Illust. Conch., p. 30, pl. 15, f. 27, 28; Ib., First Ed., pl. 42, f. 27, 28; *Helix glutinosa*, Montagu, Test. Brit., p. 379, pl. 16, f. 5; Fleming, Edin. Ency., VII, p. 81; Brown, Ency. Brit., VI, p. 461; *Myxas Mulleri*, Leach, Moll., p. 149; *Buccinum glutinosum*, Müller, Verm., II, p. 129.

Shell suborbicular, very thin, diaphanous, shining, smooth, or obsoletely wrinkled longitudinally, and of a pale yellowish horn colour; body extremely large, much inflated; spire very small, consisting of three volutions, hardly rising above the body, well defined by the suture, and terminating obtusely; aperture oval, very large, extending nearly the whole length of the body; outer lip excessively thin; destitute of an umbilicus on the pillar.

Found in ditches in England, Ireland, and Scotland.

2. *AMPHIPEPLEA LACUSTRIS*, pl. III, f. 5, 6.

Gulnaria lacustris, Leach, Moll., p. 146? Brown, Illust. Conch., p. 30, pl. 15, f. 24, 25; *Lynnæa lacustris*, First Ed., pl. 42, f. 24, 25.

Shell subovate, extremely thin, pellucid, and shining, of a pale yellowish horn colour; body very large, and inflated; spire excessively short, consisting of two small volutions, which hardly rise above the body, superior one blunt at the apex; aperture suboval, a little narrowed above; outer lip thin, expansive, with its base rounded; inner lip a little reflected on the columella, with a slight subumbilicus behind it.

I found this species in Loch Leven, Kinrossshire, Scotland.

It differs from the preceding species, in being larger and thicker, the spire having but two volutions, in the aperture being not so large and expanded, and in the base of the lip being more rounded.

In Lady Jardine's cabinet, at Jardine Hall, Dumfriesshire.

GENUS VII.—PHYSA.—Drapernaud.

Shell sinistral, or with the volutions turning in a contrary direction to the ordinary course, oval, or oblong, very thin, and polished; spire usually prominent; aperture longitudinal, ovate, or oblong, contracted above; outer lip very thin, and acute, partly obtruding above the plane of the aperture; inner lip reflected on the columella.

1. *PHYSA FONTINALIS*, pl. III, f. 13, 14.

Physa fontinalis, Drapernaud, p. 54, pl. 3, f. 8, 9; Lamarek, An. San. Vert., VI, pt. 2nd, p. 156; Pfeiffer, p. 94, pl. 4, f. 28; Brard, p. 167, pl. 7, f. 7, 8; Brown, Illust. Conch., p. 30, pl. 14, f. 54, 55; Ib., First Ed., pl. 41, f. 54, 55; Fleming, Brit. An., p. 276; Leach, Moll., p. 150; Turton, Man., p. 127, f. 110; Jeffreys, Linn. Tr., XVI, p. 379; Alder, Mag. Zool. and Bot., II, p. 114; Forbes, Mal. Mon., p. 14; Thompson, Ann. and Mag. Nat. Hist., VI, p. 48; *Bulla fontinalis*, Montagu, Test. Brit., p. 226; Brown, Wernerian Mem., II, p. 516; Ib., Ency. Brit., VI, p. 433; Fleming, Edin. Ency., VII, p. 85; *Limnea fontinalis*, Sowerby, Gen., f. 8; *Planorbis bulla*, Müller, Verm., II, p. 167.

Variety 1, pl. III, f. 11, 12. *Shell somewhat more inflated, and of a very pale horn colour, approaching to white.*

Physa alba, Turton, Zool. Journ., II, p. 363, pl. 13, f. 3; Ib., Man., p. 128, f. 111; Brown, Illust. Conch., p. 30, pl. 14, f. 56, 57.

Found in the river Towin, North Wales.

Variety 2, pl. III, f. 15, 16. *Volutions more oblique; body less inflated; base more acute; and spire more obtuse.*

Helix Bullæoides, Donovan, Brit. Sh., pl. 168, f. 2; *Bulla fluviatiles*, Turton, Conch. Dict., p. 27, the young shell; Brown, Illust. Conch., p. 30, pl. 14, f. 83, 84.

It is plentiful in a stream at Clonooney, King's County, Ireland.

Shell sinistral, oblong-oval, extremely thin, transparent, fragile, and glossy, and of a greenish horn colour; body very large; spire very short, consisting of three or four volutions, the lower one a little inflated, and terminating in a somewhat obtuse apex; aperture oblong, occupying about three-fourths the length of the shell, contracted, and pointed above, and rounded at the base. Length about three-eighths of an inch; breadth not quite a quarter.

Old shells are not unfrequently provided with a few longitudinal and transverse wrinkles.

This species is pretty generally diffused throughout Great Britain and Ireland, in rivers, streams, and stagnant pools, adhering to the under surface of aquatic plants.

2. PHYSA ACUTA, pl. III, f. 9, 10.

Physa acuta, J. Sowerby, MSS.; *Bulla fontinalis*, Maton and Racket, Linn. Tr., VIII, pl. 4, f. 1; *Physa rivalis*, Brown, Illust. Conch., p. 30, pl. 14, f. 58, 59; Ib., First Ed., pl. 41, f. 58, 59.

Shell oblong-ovate, very thin, brittle, and transparent; body very large; spire very short, consisting of four volutions, and terminating in an acute apex; aperture oblong-ovate, somewhat oblique, and lengthened beyond the body volution. Length nearly half an inch; breadth a quarter.

Found in Anglesea, Wales, and first identified as British by J. Sowerby, Esq., who bred it in a water-butt, and describes the animal as differing materially from *P. fontinalis*.

3. PHYSA HYPNORUM, pl. III, f. 17, 18.

Physa hypnorum, Drapernaud, p. 55, pl. 3, f. 12, 13; Lamarck, An. San. Vert., VI, pt. 2nd, p. 157; Pfeiffer, p. 97, pl. 4, f. 29; Brown, Illust. Conch., p. 30, pl. 14, f. 60, 61; Ib., First Ed., pl. 41, f. 60, 61; Alder, Mag. Zool. and Bot., II, p. 114; Turton, Man., p. 129, f. 113; Thompson, Ann. and Mag. Nat. Hist., VI, p. 34; Jeffreys, Linn. Tr., XVII, p. 381; *Bulla hypnorum*, Montagu, Test. Brit., p. 228; Brown, Wernerian Mem., II, p. 517; Ib., Ency. Brit., VI, p. 433; Maton and Racket, Linn. Tr., VIII, p. 127, pl. 4, f. 3; Fleming, Edin. Ency., VII, p. 85; *Amplexa hypnorum*, Fleming, Brit. An., p. 276; *Limnea turrita*, Sowerby, Gen., f. 10; *Nauta hypnorum*, Leach, Moll., p. 152; *Planorbis turritus*, Müller, Verm., II, p. 169.

Shell sinistral, elongated, subcylindrical, very smooth, glossy, and transparent, of a dark greenish horn colour; body about half the length of the shell; spire consisting of four or five well divided, and taper volutions, terminating in an acute apex; aperture ovate, narrow, contracted above, and rounded beneath; pillar somewhat sinuated.

Found in ditches, stagnant pools, and lakes in many places of Great Britain and Ireland.

GENUS VIII.—PLANORBIS.—Müller.

Shell discoidal, umbilicate; spire depressed; apex always distinct; volutions heterostrophe, or revolving from right to left,

convolving always on the same plane, and apparent on both sides; aperture oblong, lunate, or subquadrate, its breadth being nearly equal to its length, and sometimes greater; outer lip thickened, expanded, and its under part always extended forwards; umbilicus very wide; destitute of an operculum.

Section I.—Volutions devoid of a carina, rounded on both sides; spire slightly concave.

1. PLANORBIS CORNEUS, pl. III, f. 21, 22, 23.

Planorbis corneus, Drapernaud, p. 43, pl. 1, f. 42, 43, 44; Pfeiffer, p. 77, pl. 4, f. 3, 4; Lamarck, An. San. Vert., VI, pt. 2nd, p. 152; Brard, p. 147, pl. 6, f. 1, 2; Brown, Illust. Conch., p. 31, pl. 14, f. 31, 32, 33; Ib., First Ed., pl. 41, f. 31, 32, 33; Jeffreys, Linn. Tr., XVI, p. 383; Fleming, Brit. An., p. 277; Ib., Edin. Ency., VII, p. 69; Alder, Mag. Zool. and Bot., II, p. 112; Thompson, Ann. and Mag. Nat. Hist., VI, p. 48; Sowerby, Gen., f. 1; Turton, Man., p. 112, f. 95; Rossmassler, Icon., II, p. 14, pl. 7, f. 113; *Planorbis purpureus*, Müller, Verm., II, p. 154; *Planorbis similis*, p. 166, young shell; *Helix cornea*, Donovan, Brit. Sh., II, pl. 39, f. 1; Montagu, Test. Brit., p. 448; Brown, Wernerian Mem., p. 524; Ib., Ency. Brit., VI, p. 458; *Helix nana*, Pennant, Brit. Zool., IV, p. 133, pl. 83, f. 125, the young shell; p. 134, f. 126, the adult.

Shell dextral, depressed; spire consisting of four rapidly diminishing volutions, deeply divided by the suture, sunk below the level of the outer, or body volution, and coiled upon its apex, which gradually sinks, and forms a concavity, or umbilicus; under surface nearly flat, and exposing the whole volutions of the spire; entire body rounded on the sides; the shell transversely striated, and sometimes with some wrinkles, across the volutions; aperture nearly equilateral, sublunated, and oblique; outer lip thin; inner lip reflected on the columella, forming a continuous line with the peristome; colour, rufous or chestnut above, pale yellowish-brown or bluish-grey beneath. Diameter generally an inch, but often to be met with an inch and a quarter.

In the young condition, the volutions are provided with fine spiral striæ.

Found in slow rivers and stagnant ditches in England and

Ireland. It abounds in the Thames, at Battersea; large and beautiful specimens are to be met with in a ditch, near Maynooth, County of Kildare; is met with near Naas, and near Lea Castle, Queen's County, Ireland.

2. *PLANORBIS ALBUS*, pl. III, f. 30, 31.

Planorbis albus, Müller, Verm., II, p. 164; Pfeiffer, p. 80, pl. 4, f. 9, 10; Leach, Moll., p. 156; Jeffreys, Linn. Tr., XVI, p. 387; Fleming, Edin. Ency., VII, p. 69; Ib., Brit. An., p. 278; Brown, Illust. Conch., p. 31, pl. 14, f. 52, 53; Ib., First Ed., pl. 41, f. 52, 53; Turton, Man., p. 114, f. 97; Alder, Mag. Zool. and Bot., II, p. 113; Forbes, Mal. Mon., p. 13; Thompson, Ann. and Mag. Nat. Hist., VI, p. 48; *Planorbis hispidus*, Drapernaud, p. 43, pl. 1, f. 45, 46, 47, 48; Lamarck, An. San. Vert., VI, pt. 2nd, p. 154; Brard, p. 159, pl. 6, f. 6, 7; *Helix alba*, Montagu, Test. Brit., p. 459, pl. 25, f. 7; Brown, Wernerian Mem., II, p. 524; Ib., Ency. Brit., VI, p. 458.

Variety 1. Shell smooth, shining, and white.

Planorbis glaber, Jeffreys, Linn. Tr., XVI, p. 387.

Shell dextral, thin, pale yellowish-white, subpellucid, depressed; body volution very large, rounded on the sides; spire consisting of four rapidly decreasing volutions, which are equally convex both above and below; the apex of the spire somewhat sunk, forming a subumbilicus, and the under surface more concave; whole external surface covered with fine, elevated, close-set, transverse, and spiral striae, producing a reticulated appearance, which are provided with deciduous bristles; aperture very large, sublunate, somewhat higher than wide, clasping the body volution; outer lip thin, a little oblique; pillar lip white internally, spread on the columella, and continuous with the margin of the outer lip. When recent it is covered with a fine pilous epidermis.

Found principally in stagnant waters, ponds, and ditches, and by no means a plentiful species. Mr. Thompson says it prevails generally over Ireland.

3. *PLANORBIS LÆVIS*, pl. III, f. 37, 38, 39.

Planorbis lœvis, Alder, Catalogue, Sup. Trans. Newcastle Nat. Hist. Soc., II, p. 337; Ib., Mag. Zool. and Bot., II, p. 113; Thompson, Ann. and Mag. Nat. Hist., VI, p. 48; Brown, Illust. Conch., p. 31, pl. 18, f. 7, 8, 9.

Shell smooth, semitransparent; volutions equally convex both

above and below; body volution rounded on the sides, large; spire consisting of two or three small, compact, rounded volutions; whole shell with nearly obsolete lines of growth, and of a brownish horn colour; aperture sublunated, or nearly circular.

Discovered by Joshua Alder, Esq., Newcastle, in a pond on Holy Island, and has also been met with by him and the Rev. W. Mark, at Whitby, Northumberland; and has been found at the Falls, and Blackwater, and Lagar, near Belfast, by William Thompson, Esq.

4. *PLANORBIS IMBRICATUS*, pl. III, f. 40, 41.

Planorbis imbricatus, Müller, Verm., II, p. 165; Draper-naud, p. 44, pl. 1, f. 49, 50, 51; Pfeiffer, p. 84, pl. 3, f. 15; Brard, p. 163, pl. 6, f. 10, 11; Brown, Illust. Conch., p. 31, pl. 14, f. 46, 47, and pl. 18, f. 11; Ib., First Ed., pl. 41, f. 46, 47; Jeffreys, Linn. Tr., XVI, p. 388; Alder, Mag. Zool. and Bot., II, p. 114; Turton, Man., p. 11, f. 95; Forbes, Mal. Mon., p. 13; Thompson, Ann. and Mag. Nat. Hist., VI, p. 49; *Planor-bis nautilus*, Fleming, Edin. Ency., VII, p. 69; Ib., Brit. An., p. 278; *Turbo nautilus*, Brown, Ency. Brit., VI, p. 457; Ib., Wernerian Mem., II, p. 522; *Helix nautilus*, Walker, f. 20, 21; Montagu, Test. Brit., p. 464, pl. 25, f. 5.

Variety 1, pl. III, f. 42. *Shell considerably smaller, with the imbricated laminæ more distant.*

Planorbis cristatus, Drapernaud, p. 44, pl. 2, f. 1, 2, 3; Pfeiffer, p. 84; Alder, Mag. Zool. and Bot., p. 114; Brown, Illust. Conch., p. 31, pl. 18, f. 10.

Variety 2. With the laminæ quite obsolete.

Shell considerably depressed, pellucid, of a greenish or blackish horn colour; sides of the body rounded; spire consisting of two or three volutions, well divided by the suture line; somewhat largely umbilicate above and below; body volution provided with transverse spinous ribs, forming a regular crest round the centre of the sides; aperture slightly ovate; outer lip continuous all round. Diameter the tenth of an inch.

Not unfrequent in ponds and ditches, adhering to aquatic plants, in many parts of Great Britain and Ireland. Monstrosities of this species, with the volutions detached and raised above each other, were found by Dr. Turton in England, and in Ireland by William Thompson, Esq., of Belfast.

*Section II.—Volutions carinated.*5. *PLANORBIS CARINATUS*, pl. III, f. 34, 35, 36.

Planorbis carinatus, Müller, Verm., II, p. 157; Drapernaud, p. 46, pl. 21, f. 13, 14, and 16; Pfeiffer, p. 76, pl. 4, f. 5, 6; Brard, p. 150, pl. 6, f. 3; Brown, Illust. Conch., p. 32, pl. 14, f. 35, 36, 37; Ib., First Ed., pl. 41, f. 35, 36, 37; Turton, Man., p. 106, f. 87; Alder, Mag. Zool. and Bot., II, p. 113; Thompson, Ann. and Mag. Nat. Hist., VI, p. 49; *Helix complanata*, Montagu, Test. Brit., Sup., p. 146, pl. 25, f. 4; *Helix planata*, Maton and Racket, Linn. Tr., VIII, p. 189, pl. 5, f. 14; *Helix planorbis*, Linné, Syst. Nat., I, p. 1242.

Variety 1, pl. IV, f. 7, Brown, Illust. Conch., p. 32, pl. 18, f. 24; *Planorbis disciformis*, Jeffreys, Linn. Tr., XVI, p. 521; Alder, Mag. Zool. and Bot., II, p. 113; *Planorbis lutescens*, Jeffreys, Linn. Tr., XVI, p. 385; *Planorbis planatus*, Turton, Man., p. 110, f. 92; *Helix carinata*, Montagu, Test. Brit., p. 451, pl. 25, f. 1.

Shell pale horn-coloured, subpellucid; with six rapidly increasing volutions, with a prominent obtuse keel on their outer edges, almost flat above, somewhat convex, and gradually bevilling off towards the outer edge beneath, the outer volution suddenly increasing in size, and the hinder parts of each volution rather convex; aperture obliquely angular, contracted to a point beneath; provided with a slight central umbilicus. Diameter about half an inch.

This shell may be distinguished from the *Planorbis marginatus* by the under side of the volutions being less inflated, and by their gradually bevilling off to the outer edge. In old shells the volutions become more inflated. This species is frequently covered with a thick brownish coating. It is also liable to monstrosities. Sheppard, in the Linnean Transactions, vol. XIV., page 157, describes one with the volutions apart, similar to the *Scalaria preciosa*.

Found in stagnant waters in many parts of Great Britain and Ireland.

6. *PLANORBIS MARGINATUS*, pl. III, f. 26, 27, 28.

Planorbis marginatus, Drapernaud, p. 45, pl. 2, f. 11, 12, and 15; Brard, p. 152, pl. 6, f. 5; Rossmassler, Icon., II, pl. 2, f. 59; Brown, Illust. Conch., p. 32, pl. 14, f. 39, 40, 41; Ib.,

First Ed., pl. 41, f. 39, 40, 41; Alder, Mag. Zool. and Bot., II, p. 112; Turton, Man., p. 107, f. 87; *Planorbis complanatus*, Turton, Man., p. 108, f. 88; Fleming, Brit. An., p. 278; *Helix planorbis*, Pennant, Brit. Zool., II, pl. 83, f. 123; Maton and Racket, Linn. Tr., VIII, p. 188, pl. 5, f. 13; *Helix complanata*, Montagu, Test. Brit., p. 450, pl. 25, f. 4; *Planorbis umbilicatus*, Müller, Verm., II, p. 160; Jeffreys, Linn. Tr., XVI, p. 384.

It is subject to the following varieties.

Variety 1. Sides unequal, fragile, and glossy.

Planorbis turgidus, Jeffreys, Linn. Tr., XVI, p. 383.

Variety 2, the young shell, pl. IV, f. 5, 6, Brown, Illust. Conch., p. 32, pl. 18, f. 24; *Planorbis rhombeus*, Turton, Man., p. 108, f. 90; *Planorbis Sheppardii*, Leach, Moll., p. 149; *Planorbis Drapernaldi*, Jeffreys, Linn. Tr., XVI, p. 306; *Helix Drapernaldi*, Sheppard, Linn. Trans., XIV, p. 158.

Variety 3. Destitute of a keel.

Shell of a brownish horn-colour, semitransparent, slightly striated transversely, flat, or somewhat concave above, subumbilicated below; with five or six rapidly increasing, flat volutions, with a strong carina above, and ventricose and rounded to the margins beneath; aperture rhombic, with the front rounded. Three-quarters of an inch in diameter.

Found in stagnant waters all over Great Britain and Ireland.

This is to be distinguished from *P. carinatus* by its being thicker, and the volutions more rounded, and more convex beneath on the margins; in its more rounded aperture; and in the keel being less prominent.

The young shell is more rhomboidal, with the edges considerably thicker in proportion to its size, and is described and figured by Turton as a distinct species, under the name of *Planorbis rhombeus*.

A remarkable monstrosity of this species was found by Mr. Thomas Stephens, in the pond of the College Botanic Garden of Dublin; and is in the cabinet of my respected friend M. J. O'Kelly, Esq., of Rochestown House, near Cabinteely, Ireland. Plate III, f. 29.

I figured and described this monstrosity in the Wernerian Memoirs, vol. II, p. 528, pl. 24, f. 10, under the name of *Helix cochlea*. It is thus described:—

"Shell of a dark horn-colour, with seven tapering, rounded volutions; the three next the apex are twisted like a corkscrew, and terminate in a sharp point; the five lower volutions slope gradually to a carinated ridge, which commences in the centre of the outer margin of the lip, and loses itself in the fifth volution, giving the volutions the appearance of being flat at bottom; volutions slightly wrinkled obliquely across; aperture somewhat angulated, oval, and a little compressed; lip very thin, and reflected on the columella at the base, where it is provided with a deep and wide umbilicus."

Turton described and copied my shell, in his Conch. Dict., under the name of *Helix terebra*; and in his Manuel, published in 1831, followed me, in the first edition of Illustrations of the Conchology of Great Britain and Ireland, pl. 41, f. 38, in connecting it with *Planorbis marginatus*. See second edition, p. 32, pl. 14, f. 38.

7. PLANORBIS VORTEX, pl. III, f. 32, 33.

Planorbis vortex, Müller, Verm., II, p. 158, var. *a*; Draparnaud, p. 44, pl. 2, f. 4, 5; Brard, p. 154, pl. 6, f. 9; Lamarck, An. San. Vert., VI, p. 154; Pfeiffer, p. 79, pl. 4, f. 7; Ross-massler, p. 104, pl. 2, f. 61; Brown, Illust. Conch. p. 32, pl. 14, f. 44, 45; Ib., First Ed., pl. 41, f. 42, 43; Jeffreys, Linn. Tr., XVI, p. 382; Turton, Man., p. 109, f. 91; Alder, Mag. Zool. and Bot., II, p. 113; Forbes, Mal. Mon., p. 13; Thompson, Ann. and Mag. Nat. Hist., VI, p. 50; *Planorbis compressus*, Michaud, Compl., p. 81, pl. 16, f. 6 and 8; *Helix vortex*, Linné, Syst. Nat., I, p. 1242; Montagu, Test. Brit., p. 454, pl. 25, f. 3; Brown, Wernerian Mem., II, p. 524; Ib., Ency. Brit., 6th Ed., VI, p. 458; Donovan, Brit. Sh., pl. 39, f. 1; Fleming, Brit. An., p. 278.

Monstrosity. The aperture provided with a thickened internal rib, Michaud, Compl., p. 80, pl. 16, f. 3, 4, 5; Rossmassler, Icon., I, p. 105, f. 62.

Shell brownish horn-colour, transparent, very thin, flattened above, and a little concave below; with six or seven gradually increasing, obliquely and transversely striated volutions, convex before and flattened behind, and furnished with a sharp carina; aperture subtriangular, rhomboidal, white and thickened internally, and slightly compressed. Diameter about three-eighths of an inch.

Found in ditches and other stagnant waters in Great Britain and Ireland.

8. *PLANORBIS SPIRORBIS*, pl. III, f. 19, 20.

Planorbis spirorbis, Müller, Verm., II, p. 161; Brard, p. 156; Sturm, Fauna, pl. 45; Brown, Illust. Conch., p. 33, pl. 14, f. 42, 43; Ib., First Ed., pl. 41, f. 44, 45; Turton, Man., p. 115, f. 98; Alder, Mag. Zool. and Bot., II, p. 113; Forbes, Mal. Mon., p. 13; Thompson, Ann. and Mag. Nat. Hist., VI, p. 50; *Planorbis vortex*, Drapernaud, Moll., p. 45, pl. 2, f. 6, 7; Jeffreys, Linn. Tr., XVI, p. 382; Pfeiffer, p. 79, pl. 4, f. 8; *Helix spirorbis*, Montagu, Test. Brit., Sup., p. 455, pl. 25, f. 2; Maton and Racket, Linn. Tr., VIII, p. 191; Brown, Wernerian Mem., II, p. 524; Ib., Ency. Brit., 6th Ed., VI, p. 458; Turton, Brit. Fauna, p. 187.

Shell thin, semitransparent, brownish horn-colour, slightly and equally concave both above and below; with six gradually increasing, rounded, nearly equal volutions, placed quite lateral upon each other, the exterior one nearly round, provided with a flattened carina; the whole shell covered with very fine transversely oblique striæ; aperture subrotund, and rounded below. Diameter about a quarter of an inch.

Found in ditches and stagnant waters in Great Britain and Ireland.

This species seldom exceeds a quarter of an inch in diameter, and may be distinguished from the *P. vortex* by its being equally concave above and below, and in the keel on the margin of the outer volution being much less prominent, and, indeed, in some specimens it is nearly obsolete; when it is so, the aperture is not at all angulated. It is, besides, not so thin and depressed as the *P. vortex*, in proportion to its size.

Section III.—Shell shining, translucent; spire deeply umbilicate; volutions provided with a slight carina.

9. *PLANORBIS NITIDUS*, pl. IV, f. 1, 2.

Planorbis nitidus, Müller, Verm., II, p. 263; Pfeiffer, p. 82, pl. 4, f. 12, 13; Fleming, Brit. An., p. 278; Brown, Illust. Conch., p. 33, pl. 14, f. 48, 49; Ib., First Ed., pl. 41, f. 48, 49; Jeffreys, Linn. Tr., XVI, p. 389; Alder, Mag. Zool. and Bot., II, p. 114; Thompson, Ann. and Mag. Nat. Hist., VI,

p. 51; *Planorbis lenticularis*, Sturm, Fauna, VI, pl. 8, f. 16; *Planorbis fontanus*, Turton, Man., p. 110, f. 93; *Planorbis complanatus*, Drapernaud, Moll., p. 47, pl. 2, f. 20, 21, 22; Rossmassler, Icon., II, p. 16, pl. 7, f. 116; Brard, p. 161, pl. 6, f. 4; *Helix fontana*, Lightfoot, Phil. Trans., LXXVI, pl. 2, f. 1; Montagu, Test. Brit., p. 462, pl. 6, f. 6; Maton and Racket, Linn. Tr., VIII, p. 192; Brown, Wernerian Mem., II, p. 524; *Helix lenticularis*, V. Alten., p. 35, pl. 2, f. 4.

Shell pellucid, glossy, nearly destitute of wrinkles, reddish or greyish horn-coloured; lenticular, greatly flattened, almost equally convex on both sides, and a little depressed in the centre; with four volutions, the outer one subcarinate near the middle, produced by the gradual outward slope of the shell, both above and below; a small central umbilicus on the under side; the internal angles of the ribs clasp the body nearly equally on both sides, embracing nearly half the diameter of the first volution; margin very thin, and considerably oblique; aperture contracted, and almost brought to an angle externally. Diameter not a quarter of an inch.

Inhabits stagnant waters, usually adhering to aquatic plants.

This shell may be easily confounded with the *Segmentina lineata*, but is more compressed, and not so convex above, and is destitute of the lines which mark the segments of that shell.

Section IV.—Destitute of a carina; volutions rounded both before and behind, and deeply umbilicated.

10. PLANORBIS CONTRORTUS, pl. III, f. 30, 31.

Planorbis contrortus, Müller, Verm., II, p. 162; Drapernaud, Moll., p. 42, pl. 1, f. 39, 40, 41; Sturm, Fauna, pl. 3, f. 4; Pfeiffer, p. 81, pl. 4, f. 11; Lamarck, An. San. Vert., VI, pt. 2nd, p. 154; Brown, Illust. Conch., p. 33, pl. 14, f. 33, 34; Ib., First Ed., pl. 41, f. 33, 34; Jeffreys, Linn. Tr., XVI, p. 383; Fleming, Brit. An., p. 277; Forbes, Mal. Mon., p. 13; Rossmassler, Icon., II, p. 16, pl. 7, f. 117; Turton, Man., p. 113, f. 96; Brard, p. 157, pl. 6, f. 12, 13, 14; Alder, Mag. Zool. and Bot., II, p. 114; Thompson, Ann. and Mag. Nat. Hist., VI, p. 51; *Helix contorta*, Linnæ, Syst. Nat., I, p. 1244; Montagu, Test. Brit., p. 457, pl. 25, f. 6; Donovan, Brit. Sh., III, pl. 99; Brown, Ency. Brit., 6th Ed., VI, p. 458; Ib.,

Wernerian Mem., II, p. 524; *Helix umbilicata*, Pulteney, Cat. Dorset, p. 47, pl. 20, f. 11; *Helix crasius*, Da Costa, Brit. Sh., p. 66, pl. 4, f. 11.

Shell thick, depressed, of a brown horn-colour, sometimes rufous or chestnut; with five or six greatly compressed, equal sized, compact, close-set volutions, the outer one rounded, the others on the wider side rise nearly to an edge, and are divided by a deep suture, having a subumbilicus in the centre; upper side largely and deeply umbilicated, exhibiting every volution, spirally descending to the bottom; aperture crescent-shaped, compressed, and clasping the body volution. Diameter a quarter of an inch; and somewhat more than a tenth of an inch in thickness.

Common in ditches and stagnant pools in Great Britain and Ireland.

GENUS IX.—SEGMENTINA.—Fleming.

Shell divided internally by transverse septa into several chambers, which communicate into each other by triradiated apertures.

1. SEGMENTINA LINEATA, pl. IV, f. 3, 4.

Segmentina lineata, Fleming, Brit. An., p. 279; Ib., Ency. Brit., pl. 367, f. 8; *Planorbis nitidus*, Müller, II, p. 163; Drapernaud, Moll., p. 46, pl. 2, f. 17, 18, 19; Rossmassler, Icon., II, p. 15, pl. 7, f. 114, 115; Brown, Illust. Conch., p. 33, pl. 14, f. 50, 51; Ib., First Ed., pl. 41, f. 50, 51; Turton, Man., p. 116, f. 91; *Planorbis nautilus*, Fleming, Edin. Ency., VII, p. 69; Kickx, Moll. Barb., p. 66; *Planorbis lineatus*, Alder, Mag. Zool. and Bot., II, p. 114; *Nautilus lacustris*, Lightfoot, Phil. Trans., XXVI, pl. 1, fig. 1, 2, 3, 4, 5, 6, 7; Montagu, Test. Brit., p. 191, pl. 6, f. 3; *Hemithalamus lacustris*, Leach, Moll., p. 137; *Helix lineata*, Walker, Test. Min. Rar., pl. 1, f. 28.

Shell compressed, subcarinated, extremely pellucid, smooth and shining, horn-coloured, sometimes reddish-brown; upper surface convex; apex depressed, concave, and deeply umbilicate; with four volutions, the apical one lost in the depression, the outer one very large, these are bordered on their outer edge with a whitish spiral band, which terminates in the centre at the junction of the volutions; outer volution exhibiting three

white curved, remote, equidistant lines, radiating from the umbilicus; these are the internal septa which divide the chambers; under side nearly flat, and umbilicated; aperture oval, and somewhat triangular; outer lip interrupted. Diameter not a quarter of an inch.

Found in stagnant water, adhering to aquatic plants.

This shell may be easily confounded with the *Planorbis nitidus*, but if inspected through a lens the concamerations will be at once perceived.

FAMILY IV.—COLIMACEA.

Spiral; destitute of any exterior projections, except the additions of growth; outer lip frequently reflected; terrestrial or amphibious; tentacles of the animal cylindrical, with or without an operculum.

Section I.—Animals with two tentacles.

GENUS X.—CYCLOSTOMA.—Lamarek.

Shell turbinated, variable in shape, thin; the apex in most species obtuse, and the volutions ventricose; aperture entire, circular, or nearly so in the adult state; outer lip more or less angular at the upper part, sometimes thickened, usually reflected and united all round, and frequently externally fringed; operculum spiral, horny, but inclining to testaceous in some species, consisting of a few depressed convolutions, provided with a simple testaceous internal coating.

1. CYCLOSTOMA ELEGANS, pl. IV, f. 10, 11.

Cyclostoma elegans, Drapernaud, p. 32, pl. 1, f. 5 and 8; Lamarek, An. San. Vert., VI, pt. 2nd, p. 148; Pfeiffer, p. 74, pl. 4, f. 30, 31; Brown, Illust. Conch., p. 34, pl. 14, f. 28; Ib., First Ed., pl. 41, f. 28; Turton, Man., p. 93, f. 75; Fleming, Brit. An., p. 257; Alder, Mag. Zool. and Bot., II, p. 112; Brard, p. 103, pl. 3, f. 7, 8; Jeffreys, Linn. Tr., XVI, p. 63; Thompson, Ann. and Mag. Nat. Hist., VI, p. 51; *Cyclostomus elegans*, De Montfort, II, p. 287; *Turbo elegans*, Montagu, Test. Brit., p. 342, pl. 22, f. 7; Maton and Racket, Linn. Tr., VIII, p. 167; Brown, Wernerian Mem., II, p. 522; Ib., Ency. Brit., VI, p.

456; Fleming, Edin. Ency., VII, p. 74, pl. 203, f. 10; *Turbo tumidus*, Pennant, Brit. Zool., IV, p. 128, pl. 82, f. 110; *Turbo striatus*, Da Costa, p. 86, pl. 5, f. 9; Donovan, Brit. Sh., II, pl. 59; *Nerita elegans*, Müller, Verm., II, p. 177.

Shell tapering, oblong-ovate; body large, tumid; spire consisting of four ventricose volutions, and ending in an obtuse apex; whole external surface provided with numerous, close-set, raised, spiral striæ, crossed by finer longitudinal striæ, producing a reticulated appearance; aperture round, with a slight angular contraction above; outer lip thin, smooth on the edge, and continuous; inner lip slightly reflected on the columella, with a subumbilicus behind; colour usually cinereous, with a purplish tinge, and reddish-purple at the apex; frequently fasciated with two rows of purplish-brown spots, or interrupted bands, or in some instances longitudinally streaked with a similar colour; operculum horny externally, and testaceous on its inner surface, with a single depressed spiral line, and a series of fine striæ radiating from it towards the circumference. Length five-eighths of an inch; breadth three-eighths.

Found in the Limestone districts of England and Wales; and Portrush, Ireland.

2. CYCLOSTOMA MARMOREA, pl. IV, f. 13.

Cyclostoma marmorea, Brown, Edin. Jour. Nat. and Geo. Science, I, p. 12, pl. 1, f. 10, 11; Ib., Illust. Conch., p. 34, pl. 18, f. 15.

Shell oblong-ovate; body large, inflated; spire small, consisting of four deeply divided volutions, abruptly tapering to an obtuse apex; aperture quite orbicular; outer lip united all round; pillar lip slightly reflected on the columella, behind which is a deep umbilicus; whole surface smooth, glossy, of a pale ash colour, covered with zig-zag markings of a reddish chestnut-brown, which form four spiral fasciæ on the lower volution, and gradually become obsolete on the superior portion of the spire.

I noticed this elegant shell in the cabinet of my friend James Gerard, Esq., Edinburgh, associated with some British specimens of *Cyclostoma elegans*, to which it is closely allied in form, but may at once be distinguished from that shell in being totally devoid of striæ, which in the *C. elegans* are very strong and conspicuous.

GENUS XI.—CARYCHIUM.—Müller.

Shell oblong or cylindrical, with gradually increasing volutions, few in number; aperture straight, short, with folds on the columella.

1. CARYCHIUM MINIMUM, pl. IV, f. 8, 9.

Carychium minimum, Müller, Verm., II, p. 125; Pfeiffer, I, p. 72, pl. 3, f. 45, 46; Leach, Moll., p. 133; Brown, Illust. Conch., p. 34, pl. 14, f. 10, and pl. 18, f. 15; Ib., First Ed., pl. 41, f. 10; Jeffreys, Linn. Tr., XVI, p. 365; Fleming, Brit. An., p. 270; Forbes, Mal. Mon., p. 12; Alder, Mag. Zool. and Bot., II, p. 114; Thompson, Ann. and Mag. Nat. Hist., VI, p. 42; *Odostomo carychium*, Fleming, Edin. Ency., VII, p. 76; *Auricella carychium*, Hartman, p. 49; *Auricula minima*, Draper-naud, Moll., p. 57, pl. 3, f. 18, 19; *Turbo carychium*, Montagu, Test. Brit., p. 339, pl. 22, f. 2; Maton and Racket, Linn. Tr., VIII, p. 184; Brown, Ency. Brit., 6th Ed., VI, p. 457.

Shell conic, glossy, pellucid, white; body and spire of about equal length; the latter consisting of four very gradually tapering, minutely striated volutions, well defined by the suture, terminating in a somewhat obtuse apex; aperture semioval, or auriform, rounded both above and below; columella provided with two tooth-like folds, and sometimes a small rudimentary one above the others; outer lip with a thickened margin, and in its centre a tooth-like knob. Length hardly a line; breadth one-third its length.

This is the most minute of all the land shells, and is found pretty generally diffused at the roots of grass, or on mossy banks, in woods, and other moist situations.

GENUS XII.—ACME.—Hartmann.

Shell subcylindrical, terminating in a blunted apex; aperture ovate, simple; outer lip simple, thin, slightly reflected over the columella, forming a subumbilicus.

1. ACME FUSCA, pl. IV, f. 15.

Acme lineata, Hartmann, Sturm, Faun., pl. 1, f. 4; *Acme fusca*, Brown, Illust. Conch., p. 34, pl. 14, f. 25; Ib., First Ed., pl. 41, f. 25; Thompson, Ann. and Mag. Nat. Hist., VI, p. 43; *Turbo fuscus*, Walker, Test. Min. Rar., p. 112, pl. 2, f. 42;

Montagu, Test. Brit., p. 330; Wood, Sup., pl. 6, f. 15; *Carychium cochlea*, Studer, Catal., p. 21; *Carychium fuscum*, Fleming, Brit. An., p. 270; Jeffreys, Linn. Tr., XVI, p. 364; *Carychium lineatum*, Féruſſac, Tab. Syst., p. 100; Rossmassler, V, p. 54, pl. 28, f. 408; *Cyclostoma lineatum*, Féruſſac, Dict. Class. Hist. Nat., II, p. 90; *Auricula lineata*, Drapernaud, Hist., p. 57, pl. 3, f. 20, 21; *Balimus lineatus*, Turton, Man., p. 82, f. 66; Ib., Zool. Journ., II, p. 565.

Shell cylindrical, of a brown colour, and extremely glossy; body somewhat shorter than the spire; which consists of five nearly flat volutions, decreasing but little in diameter, except the two upper ones, which are a little less, somewhat paler, and terminating in a blunted apex; volutions divided by a well marked suture, and covered with remote, regular, longitudinal striae, which are invisible without the aid of a strong lens; aperture subovate; pillar lip slightly reflected on the columella, with a small subumbilicus behind; outer lip thin, and even. Length about the tenth of an inch; diameter nearly a sixth.

Found in damp situations amongst moss and jungermanniæ.

2. ACME MINUTA, pl. IV, f. 16.

Acme minuta, Brown, Illust. Conch., p. 35, pl. 14, f. 26; Ib., First Ed., pl. 41, f. 26.

Shell cylindrical, smooth, shining, and of a greenish-brown colour; spire consisting of four slightly raised volutions, separated by a well marked suture, and terminating in an obtuse apex; aperture subovate; pillar lip slightly reflected on the columella; outer lip thin, and even on the edges. Length about the tenth of an inch; diameter not a sixth.

I found this minute species at Douglas Castle, Lanarkshire, amongst jungermanniæ, in the low meadow land below the old tower.

This species may be distinguished from the *A. fusca* by being longer in proportion to its breadth, in the volutions being more inflated, and in being entirely destitute of spiral striae.

Section II.—Animals with four tentacula.

GENUS XIII.—SUCCINEA.—Drapernaud.

Shell subovate, or ovately conical, mostly elongated; spire short; aperture longitudinal, oblique, large, entire, and usually

about two-thirds the length of the shell; margin of the outer lip thin, sharp, and not reflected, united to the columellar lip below; columella smooth, sharp-edged, narrow, and attenuated; inner lip spread over a small portion of the body volution.

The shells of this genus are distinguished from the *Lymnaea*, by being destitute of the oblique fold on the columella.

1. *SUCCINEA AMPHIBIA*, pl. IV, f. 20, 21.

Succinea amphibia, Drapernaud, Hist. Moll., p. 58, pl. 3, f. 22, 23; Lamarck, An. San. Vert., VI, p. 135; Pfeiffer, p. 67, pl. 3, f. 36 and 38; Brown, Illust. Conch., p. 35, pl. 14, f. 41, 42; Ib., First Ed., pl. 42, f. 41, 42; Sowerby, Gen., f. 3; Brard, p. 72, pl. 3, f. 1; Turton, Man., p. 91, f. 73; Alder, Mag. Zool. and Bot., II, p. 106; *Succinea putris*, Fleming, Brit. An., p. 267; Jeffreys, Linn. Tr., XVI, p. 325 and 505; Thompson, Ann. and Mag. Nat. Hist., VI, p. 35; *Succinea Mülleri*, Leach, Moll., p. 78; *Helix putris*, Linné, Syst. Nat., I, p. 1249; Donovan, Brit. Sh., pl. 168, f. 1; *Helix succinea*, Müller, Verm., II, p. 97; Brown, Wernerian Mem., II, p. 530; Maton and Racket, Linn. Tr., VIII, p. 218; *Lymnea succinea*, Fleming, Edin. Ency., VII, p. 77; *Helix limosa*, Dillwyn, Des. Cat., p. 965.

Shell oblong-ovate, smooth, extremely thin and pellucid, and glabrous, of a greenish or yellowish-amber colour; body very large; spire very small, nearly perpendicular to the base, or slightly oblique, consisting of three rapidly diminishing volutions, terminating in an acute apex; aperture very large, occupying about three-fourths the shell, narrowed above, and rounded beneath; outer lip plain, sharp, and very thin. The columella is visible through its entire length.

2. *SUCCINEA GRACILIS*, pl. IV, f. 26, 27.

Succinea gracilis, Alder, Mag. Zool. and Bot., II, p. 106; *Succinea oblonga*, Leach, Moll., MSS.; Brown, Illust. Conch., p. 35, pl. 14, f. 34, 35; Ib., First Ed., pl. 42, f. 34, 35; Turton, Man., p. 92, f. 74; Alder, Cat. 6, No. 20; *Succinea Pfeifferi*, Rossmassler, Icon., pl. 92, f. 46; Thompson, Ann. and Mag. Nat. Hist., VI, p. 35; *Succinea amphibia*, var. *b*, Pfeiffer, p. 67, pl. 3, f. 37, var. *β*; Nilson, p. 41, *γ* and *δ*; Drapernaud, Moll., f. 23; *Succinea putris*, var. *a*, Jeffreys, Linn. Tr., XVI, p. 325 and 505; *Helix putris*, Montagu, Test. Brit., p. 376, pl. 16, f. 4.

Shell oblong-ovate, slender, pellucid, shining, and of a bright amber colour; body very large; spire very small, consisting of three rapidly diminishing volutions, with an acute apex; aperture very large, oblong-ovate, contracted above, wide and rounded below, and placed very oblique; outer lip thin, and sharp at the edge.

Variety 1, pl. IV, f. 22, 23. This elegant variety of the species was found at Beaumaris, Anglesea, North Wales, by my friend Thomas Glover, Esq., of Smedley Hill, Manchester. It is much thicker in proportion to its size, and of a deep flesh colour; the spire is also more inflated than the ordinary specimens.

This shell seldom attains the same size as the *S. amphibia*, and may readily be distinguished by its very oblique aperture, and in being more elongated. It inhabits the banks of ponds, rivers, and streams.

3. SUCCINEA OBLONGA, pl. IV, f. 9.

Succinea oblonga, Drapernaud, Hist. des Moll., p. 59, pl. 3, f. 24, 25; Pfeiffer, p. 68, pl. 3, f. 39; Jeffreys, Linn. Tr., XVI, p. 325 and 505; Alder, Mag. Zool. and Bot., II, p. 106; Johnston, Proceedings Berwickshire Nat. Hist. Club, p. 154; Brown, Illust. Conch., p. 35, pl. 18, f. 21.

Shell oval, shining, pellucid, and of a pale amber colour; body large; spire small, consisting of three well defined volutions, terminating in an acute apex; aperture very large, contracted above, and expanded and round below; outer lip thin, and acute at the edge. Length a quarter of an inch; diameter not an eighth of an inch.

Found on the margin of ditches at Bathgate, Lanarkshire, by Mr. Kenyon of Preston; at Britonferry, near Swansea, by Mr. Jeffreys; and near Berwick-upon-Tweed, by Dr. Johnston.

GENUS XIV.—ACHATINA.—Lamarck.

Shell ovate, or oblong; body large; spire short in most species, but it is sometimes lengthened and elevated; aperture entire, longitudinal; outer lip thin, never reflected; inner lip but slightly spread over the base of the body; columella smooth, and destitute of folds or teeth, and truncated at the base.

Distinguished from *Bulimus* by the abrupt termination of the pillar lip.

1. ACHATINA ACICULA, pl. IV, f. 28, 29.

Achatina acicula, Lamarck, An. San. Vert., VI, pt. 2nd, p. 133; Fleming, Brit. An., p. 267; Brown, Illust. Conch., p. 36, pl. 14, f. 82, and pl. 18, f. 12; Ib., First Ed., pl. 41, f. 82; *Achatina alba*, Turton, Man., p. 89, pl. 71; Alder, Mag. Zool. and Bot., II, p. 110; Thompson, Ann. and Mag. Nat. Hist., VI, p. 37; *Bulimus acicula*, Bruguière, Ency. Meth., 22; Drapernaud, Hist. de Moll., p. 75, pl. 4, f. 25, 26; Brard, p. 100, pl. 3, f. 21; *Buccinum terrestre*, Montagu, Test. Brit., p. 248, pl. 8, f. 3; Maton and Racket, Linn. Tr., VIII, p. 139; *Buccinum acicula*, Müller, Verm., II, p. 150; Dillwyn, Des. Cat., p. 652; *Cionella acicula*, Jeffreys, Linn. Tr., XVI, p. 348.

Shell white, pellucid, smooth, glossy; body occupying about half the length of the shell; spire taper, consisting of five nearly flat-sided volutions, well defined by the suture; aperture oblong-ovate, subtruncated at the base; outer lip thin, even; pillar lip thickened, and a little reflected on the columella. Length a quarter of an inch; and hardly a fourth of its length in diameter.

This species is not uncommon in many parts of Great Britain and Ireland. It inhabits the roots of grass and trees, especially where there are limestone rocks; plentiful in Barham Downs, Kent; Lackham, Wiltshire; and at Miltown Malbay, in the neighbourhood of Dublin; La Bergerie, Queen's County; Castle Martyr, near Cork; and at Dromana, County of Waterford, by Miss M. Ball of Dublin.

GENUS XV.—BULIMUS.—Lamarck.

Shell oval, or oblong, generally thin, and covered with a slender epidermis; spire obtuse, variable in length, and in the number of its volutions, which for the most part are few; aperture oval, wide, anteriorly rounded; outer lip simple, reflected, continuous, and joining the columella without an emargination; columella smooth, straight, without a truncature, or widening at the base.

1. *BULIMUS OBSCURUS*, pl. IV, f. 24, 24.*

Bulimus obscurus, Drapernaud, Hist. des Moll., p. 74, pl. 4, f. 23; Pfeiffer, I, p. 52, pl. 3, f. 11; Brard, p. 97, pl. 3, f. 19; Fleming, Brit. An., p. 265; Brown, Illust. Conch., p. 36, pl. 14, f. 19, and pl. 18, f. 13; Ib., First Ed., pl. 41, f. 19; Turton, Man., p. 81, f. 63; Jeffreys, Linn. Tr., XVI, p. 343; Alder, Mag. Zool. and Bot., II, p. 109; Thompson, Ann. and Mag. Nat. Hist., VI, p. 35; *Bulimus hordaceus*, Bruguière, Eney. Meth., p. 331, No. 62; Lamarck, An. San. Vert., VI, pt. 2nd, p. 125; *Ena obscura*, Leach, Moll., p. 113; *Helix obscura*, Müller, Verm., p. 103; Montagu, Test. Brit., p. 391, pl. 22, f. 5; Maton and Racket, Linn. Tr., VIII, p. 212, pl. 5, f. 11; Brown, Wernerian Mem., II, p. 529; Ib., Eney. Brit., 6th Ed., VI, p. 461; *Turbo rupium*, List. Angl., pl. 2, f. 3; Da Costa, Brit. Conch., p. 90.

Variety 1, pl. IV, f. 24.*

Shell subcylindrical, subconic, of an opaque brownish horn-colour; body not half the length of the shell; spire consisting of five or six somewhat inflated volutions, well defined by the suture, covered with longitudinal slight substriae, or wrinkles, and terminating in a rather obtuse apex; aperture oblong-oval; outer lip even, and white; inner lip white, and reflected on the columella, with a slight subumbilicus behind. Length three-eighths of an inch; diameter one-third its length.

The young shell is conical, or pyramidal, and in the very early stages trochiform, with the aperture subquadangular.

This species can only be distinguished from the *B. montanus* by its inferior size, its white lip, and in its volutions being somewhat more inflated.

Found amongst moss in moist places, under stones, and on old walls, and also on rocks; in which last locality I found some fine specimens near Sunderland. It is by no means rare in England, and I met with it on a dry mud wall, near Clo-nooney Barracks, King's County, Ireland; and Mr. Thompson says, that Robert Ball, Esq., pointed out a locality in the demesne of Woodlands, near Dublin, where it is found at the roots of trees. It has been met with by the Rev. B. J. Clarke, at La Bergerie, Portarlington; and at Laore, County of Antrim, by W. H. Harvey, Esq.

I found a very distinct variety of this species in the limestone

quarry on the top of the East Lomond hill, Fifeshire, and named it *B. brevis*, pl. IV, f. 24.* It differs from the ordinary variety in being much shorter, and greatly more inflated in proportion to its size, with the apex more acute.

2. *BULIMUS MONTANUS*, pl. IV, f. 10, 11.

Bulimus montanus, Drapernaud, Hist. des Moll., p. 74, pl. 4, f. 22; Pfeiffer, I, p. 52, pl. 3, f. 10; Sturm, Fauna, VI, pl. 6; Brown, Illust. Conch., p. 36, pl. 14, f. 22, and pl. 18, f. 14; Ib., First Ed., pl. 41, f. 22; Turton, Man., p. 80, f. 62; Alder, Mag. Zool. and Bot., II, p. 109; *Bulimus montaculus*, Jeffreys, Linn. Tr., XVI, p. 345; *Bulimus Lackhamensis*, Fleming, Brit. An., p. 265; Thompson, Ann. and Mag. Nat. Hist., VI, p. 35; *Ena montana*, Leach, Moll., p. 113; *Helix Lackhamensis*, Montagu, Test. Brit., p. 394, pl. 11, f. 3; Brown, Wernerian Mem., II, p. 529; Ib., Ency. Brit., 6th Ed., VI, p. 461; Maton and Racket, Linn. Tr., VIII, p. 212.

Shell subconic, oblong, of a dull rusty or reddish-brown, longitudinally, obliquely, and irregularly wrinkled, or striated, somewhat like shagreen when viewed through a strong lens; body a little more than a third of the shell in length; spire consisting of six nearly flat-sided volutions, well divided by the suture line, terminating in a rather obtuse apex; aperture subovate; outer lip reflected, and of a chocolate-brown colour; pillar lip reflected on the columella, forming a subumbilicus behind it. Length somewhat more than five-eighths of an inch; and a quarter of an inch in diameter.

Found at Lackham, in Wiltshire, by Colonel Montagu; met with sparingly in the debris of Salisbury Crags, at Edinburgh; and I found it at Castle Willan, near Maryborough, Queen's County; and in the debris of the mountains of Mourne, Ireland.

The young shells of this, like those of the preceding species, are trochiform; and the adult is liable to considerable variety in colour.

3. *BULIMUS LUBRICUS*, pl. IV, f. 12.

Bulimus lubricus, Bruguière; Lamarck, An. San. Vert., VI, pt. 2nd, p. 126; Drapernaud, Hist. des Moll., p. 75, pl. 4, f. 24; Brard, p. 98, pl. 3, f. 20; Pfeiffer, I, p. 50, pl. 3, f. 7; Brown, Illust. Conch., p. 36, pl. 14, f. 20; Ib., First Ed., pl. 41, f. 20; Turton, Man., p. 82, f. 65; Fleming, Brit. An., p. 265; *Achatina*

lubrica, Thompson, Ann. and Mag. Nat. Hist., VI, p. 36; Alder, Mag. Zool. and Bot., II, p. 110; Forbes, Mal. Mon., p. 10; *Cionella lubrica*, Jeffreys, Linn. Tr., XVI, p. 347; *Zua lubrica*, Leach, Moll., p. 114; *Helix lubrica*, Müller, Verm., II, p. 104; Montagu, Test. Brit., p. 390, pl. 22, f. 6; Brown, Wernerian Mem., II, p. 529; Ib., Ency. Brit., 6th Ed., VI, p. 461; Maton and Racket, Linn. Tr., VIII, p. 213, pl. 5, f. 12; *Turbo glaber*, Da Costa, Brit. Conch., p. 87, pl. 5, f. 18.

Shell extremely smooth, glossy, and pellucid, of a brown or greenish horn-colour; body about half the length of the shell; spire consisting of five slightly inflated volutions, well defined by the line of the suture, and terminating in a somewhat obtuse apex; aperture oval; outer lip rather thick, but not marginate, or reflected; pillar lip a little replicated, but destitute of an umbilicus. Length a quarter of an inch; diameter one-third its length.

Not uncommon in Britain in moist situations, residing principally on the ground, under old trees, and on the banks of ditches. It is also generally diffused throughout Ireland. Mr. Thompson says, it is found under stones on the dry mountain side at Wolfhills, near Belfast; and adds, "I have obtained a few specimens, of a handsome variety, of a pale gray colour, and transparent, with a white peristome; in such localities, this shell does not present to the same degree the rich amber colour and brilliant polish, which it does in woods or shady places."

4. BULIMUS ACUTUS, pl. IV, f. 31, 32.

Bulinus acutus, Bruguière, Ency. Meth., p. 42; Drapernaud, Hist. des Moll., p. 77, pl. 4, f. 29, 30; Lamarek, An. San. Vert., VI, pt. 2nd, p. 125; Fleming, Brit. An., p. 265; Jeffreys, Linn. Tr., XVI, p. 346; Alder, Mag. Zool. and Bot., II, p. 109; Forbes, Mal. Mon., p. 10; Thompson, Ann. and Mag. Nat. Hist., VI, p. 36; *Bulimus fasciatus*, Turton, Man., p. 84, f. 67; and p. 86, f. 79, *Bulimus ventricosus*; *Helix acuta*, Müller, Verm., II, p. 110; Dillwyn, Des. Cat., p. 956; *Helix bifasciatus*, Maton and Racket, Linn. Tr., VIII, p. 210; Turton, Conch. Dict., p. 63; Brown, Wernerian Mem., II, p. 529; *Turbo fuscatus*, Pennant, Brit. Zool., IV, p. 131, pl. 82, f. 119; Montagu, Test. Brit., p. 346, pl. 22, f. 1; Da Costa, Brit. Conch., p. 90; Donovan, Brit. Sh., I, pl. 18,

f. 1, 1; *Elisma fuscata*, Leach, Moll., p. 109; *Bulimus acutus*, Brown, Illust. Conch., p. 37, pl. 14, f. 18; Ib., First Ed., pl. 41, f. 18.

Shell oblong, taper, thin, subpellucid, of a yellowish or grayish-white, longitudinally streaked, or spirally banded with chestnut or umber-brown; body somewhat more than a third of the length of the shell; spire consisting of nine or ten somewhat rounded volutions, not very deeply separated by the suture, and terminating in a rather acute apex; whole shell coarsely wrinkled longitudinally; aperture subovate; outer lip thin; inner lip a little reflected on the columella, with a small subumbilicus behind. Length nearly three-quarters of an inch; diameter a quarter.

This species is liable to considerable variety in its markings; sometimes it is longitudinally streaked, at others having a single band of interrupted spots at the base of the volutions, in some instances it has two bands, which, at the base often become confluent, and not unfrequently it is nearly white. It is also liable to some variations in shape and size.

Found on many of the sand and bent pastures of Great Britain and Ireland, near the sea shore, as well as in inland localities; Thompson, also, gives as a habitat the crevices of the walls of the old church of Howth, at a considerable height from the ground, and although local in its habitat, generally very abundant where it is found. He says, it is found from north to south of Ireland—from the neighbourhood of the Giant's Causeway to Youghal; and at Ballyshannon, County of Donegal.

GENUS XVI.—BALÆA.—Gray.

Shell thin, with the convolutions reversed, covered with a slender brown epidermis; body short; spire long and taper, with many volutions, gradually decreasing in size as they ascend; aperture small, subquadrate; outer lip entire, a little thickened, with a slight fold on the columella; base entire.

1. BALÆA FRAGILIS, pl. IV, f. 30.

Balea fragilis, Leach, Moll., p. 116; Turton, Man., p. 87, f. 70; Alder, Mag. Zool. and Bot., II, p. 111; *Balea fragilis*, Gray, Zool. Journ., I, p. 61; Forbes, Mal. Mon., p. 11; *Balea*

perversa, Fleming, Brit. An., p. 271; *Balæa perversa*, Thompson, Ann. and Mag. Nat. Hist., VI, p. 41; *Odostomia perversa*, Fleming, Edin. Ency., VII, p. 76; *Clausilia fragilis*, Jeffreys, Linn. Tr., XVI, p. 351; *Pupa fragilis*, Drapernaud, Hist. des Moll., p. 68, pl. 4, f. 4; *Turbo perversus*, Montagu, Test. Brit., p. 355, pl. 11, f. 12; Maton and Racket, Linn. Tr., VIII, p. 181, pl. 5, f. 2; Brown, Ency. Brit., 6th Ed., VI, p. 456; *Balæa fragilis*, Brown, Illust. Conch., p. 37, pl. 14, f. 11; Ib., First Ed., pl. 41, f. 11.

Shell elongated, subpellucid, thin, with a yellowish-brown epidermis; body short; spire very long, consisting of from five to eight somewhat ventricose volutions, well defined by the suture, and terminating in a slightly obtuse apex; aperture subquadrate; outer lip thin, white, a little reflected; pillar lip white, narrowly reflected on the columella, with a small subumbilicus behind; whole shell covered with slender longitudinal striæ. Length seldom exceeding a quarter of an inch; diameter a fourth of its length.

Old shells are frequently furnished with an obsolete tooth-like fold about the middle of the columella.

This species has much the aspect of a *Clausilia*, and may be mistaken for a young shell of that genus, but is distinguished by the body being convex and simple, and destitute of the carinated ridge near the outer edge, as in the young *Clausiliæ*. The volutions being sinistral, will at once mark it from the genera *Pupa* and *Bulimus*.

This is a very local species, in Britain, inhabiting the trunks of trees, under the loose bark, or lurking in the Lichens which invest the bark; and is not unfrequently met with in the clefts of rocks. According to Thompson, it is generally distributed over Ireland.

GENUS XVII.—CLausilia.—Drapernaud.

Shell sinistral, elongated, fusiform, turreted, slender; spire with numerous volutions, terminating in a somewhat obtuse, or papillary apex, and swelling gradually towards the body—some species are thickest in the centre; aperture ovate, irregular, oblique, peretreme, continuous, united all round, the lip generally thickened on the edge, and reflected; columella furnished

with tooth-like plaits, and a small spiral, elastic, shelly plate, attached by an elastic pedicle to the columella teeth within; destitute of an operculum.

The shelly bone which is attached to the columellar teeth is termed the *clausium*, and from whence the generic name is derived. Its function seems to be, to close up the aperture, when the animal has receded within its shell. A highly distinctive character in the shells of this genus, is, that the body is usually less in diameter, than the volution next it.

Section I.—Shell smooth; the clausium or shelly plate with a notch at top, fitting into a plait situated on the outer lip of the aperture.

1. **CLAUSILIA BIDENS**, pl. IV, f. 33, 34.

Clausilia bidens, Drapernaud, Hist. des Moll., p. 60, pl. 4, f. 5, 6, 7; Pfeiffer, p. 60, pl. 3, f. 25; Brard, p. 83, pl. 3, f. 9; Alder, Mag. Zool. and Bot., II, p. 110; Rossmassler, Icon., I, p. 76, pl. 2, f. 29; Fleming, Brit. An., p. 271; Thompson, Ann. and Mag. Nat. Hist., VI, p. 42; *Helix bidens*, Müller, Verm., II, p. 116, No. 315; *Turbo laminatus*, Montagu, Test. Brit., p. 359, pl. 11, f. 4; *Clausilia lamellata*, Leach, Moll., p. 118; Turton, Man., p. 70, f. 53; *Bulimus bidens*, Bruguière, Ency. Meth., p. 352, No. 93; *Clausilia bidens*, Brown, Illust. Conch., p. 37, pl. 14, f. 12; Ib., First Ed., pl. 41, f. 12.

Shell with from ten to twelve reversed, smooth, glossy, pellucid volutions, of a reddish horn-colour; body volution very small; spire very long; the volutions thickening towards the middle, and tapering from thence to a small, somewhat obtuse, and rounded point; each of the volutions swelling a little in the centre, and the whole well defined by the suture line; aperture suborbicular, compressed, thickened, and white at the upper outer margin, where it unites with the body; outer lip white, slightly marginated and reflexed, with two laminar plaits or folds, one of which is straight, situate near the superior portion of the aperture, and nearly central, the other somewhat curved, placed in the middle of the pillar lip, and frequently crenated; deep within the aperture are situate three or four prominent ridges, which are discernible when held up betwixt the observer and the light. General length three-quarters of an inch; diameter, one-fourth of its length: the clausium is emarginate.

This species is subject to some variation in colour and diameter; some specimens being of a greenish-yellow, while others are more ventricose in the centre; it also differs a little in length.

The favourite resort of this species is a calcareous soil; it is to be met with in woods of beech trees, and has been found at Bow Wood, the seat of the Marquis of Lansdowne, Lackham Wood, Wiltshire; and I found it, of a large size, on the bark of a decayed tree at Hexham; and at Dove Dale, Derbyshire, by William Thompson, Esq. It has been found at Belamont Forest, near Coothill, County of Cavan, Ireland, by my friend T. W. Warren, Esq., of Dublin, and on trees, in the demesne of Florence Court, County of Fermanagh, by that able conchologist, William Thompson, Esq., of Belfast.

This is a very local species, and certainly the most beautiful of our native *Clausiliæ*.

Section II.—Shells corrugated; and with the clausium entire at the top.

2. *CLAUSILIA BIPPLICATA*, pl. IV, f. 35, 36.

Clausilia biplicata, Leach, Moll., p. 120; Alder, Mag. Zool. and Bot., II, p. 110; Fleming, Brit. An., p. 271; Turton, Man., p. 72, f. 55; *Clausilia Montagui*, Gray, Ann. Phil., p. 13; *Clausilia verrucosa*, Drapernaud, Hist. des Moll., p. 71, pl. 4, f. 11; Pfeiffer, p. 63, pl. 3, f. 29; Jeffreys, Linn. Tr., XVI, p. 354; *Clausilia similis*, Rossmassler, Icon., p. 177, pl. 2, f. 30; *Turbo biplicatus*, Montagu, Test. Brit., p. 361, pl. 11, f. 5; *Helix perversa*, adult, Müller, Verm., II, p. 118; *Helix cochlodina ventricosula*, Férussac, pl. 63; *Clausilia biplicata*, Brown, Illust. Conch., p. 38, pl. 14, f. 13; Ib., First Ed., pl. 41, f. 13.

Shell opaque grayish-brown; with twelve or thirteen reversed volutions; whole surface covered with numerous, longitudinal, strong, regular, slightly oblique striae; volutions well defined by the sutural line, which is rather deep, and terminating in a somewhat blunted apex; aperture suborbicular, rounded below, considerably compressed above, and a little sinuous at the upper and inner angle; provided internally with two plaits, one situate near the top of the pillar lip, and the other about half way down the base of the columella, their points approximating to

each other as they recede inwardly; lips thick, white, and continuous and detached all round.

This species is distinguished from *C. bidens* by its colour, superior size, and particularly in the shape of the aperture, the margins of which are reflexed and produced, and the teeth are much closer together in proportion to the size of the shell.

First identified as a British species by Colonel Montagu, who discovered it at Easton Grey, Wiltshire, and has been found in Hyde Park, London. Its chief habitation is in woods and close-set hedges.

3. CLAUSILIA RUGOSA, pl. IV, f. 37, 38.

Clausilia rugosa, Drapernaud, Hist. des Moll., p. 73, pl. 4, f. 19, 20; Pfeiffer, p. 63, pl. 3, f. 30; Leach, Moll., p. 121; Turton, Man., p. 74, f. 58; Alder, Mag. Zool. and Bot., II, p. 111; *Clausilia perversa*, Fleming, Brit. An., p. 271; *Clausilia nigricans*, Jeffreys, Linn. Tr., XVI, p. 351; Thompson, Ann. and Mag. Nat. Hist., VI, p. 42; *Clausilia parvula*, Leach, MSS.; Turton, Zool. Journ., II, p. 556; Ib., Man., p. 74, f. 58; Jeffreys, Linn. Tr., XVI, p. 352; *Turbo nigricans*, Dillwyn, Cat., p. 375; *Turbo perversus*, Pennant, Brit. Zool., IV, p. 130, pl. 82, f. 116; *Turbo bidens*, Montagu, Test. Brit., p. 357, pl. 11, f. 7; Brown, Ency. Brit., 6th Ed., VI, p. 556; *Helix perversa*, Müller, Verm., p. 118; Brown, Wernerian Mem., II, p. 523; *Clausilia rugosa*, Brown, Illust. Conch., p. 38, f. 14; Ib., First Ed., pl. 41, f. 14.

Variety 1. Shell smaller, and more slender in form.

Variety 2. Shell shorter, with fewer volutions.

Clausilia Everetti, Ann. Phil., N. series, XIX, p. 377.

Shell somewhat opaque, blackish or chocolate-brown, frequently with ash-coloured or whitish longitudinal streaks, slender; with about twelve volutions, slightly inflated in the middle, and covered with elevated, granular, longitudinal striae; aperture oval, the inner lip a little contracted, the columella provided with three plaits, the lower one placed interiorly, and scarcely discernible in the adult shell; lips thick, detached from the body, and pure white. Length generally about half an inch.

This is the most common species of *Clausilia*; inhabiting rocky or woody situations; it is subject to great variety in size, and even diameter. It is generally distributed throughout

Great Britain and Ireland, and the surrounding islands. Mr. Thompson mentions a specimen found by him near Belfast, which measures seven and a half lines in length, and is furnished with thirteen volutions; and several others six lines long, which have likewise the same number of volutions.

The *Clausilia parvula* of Dr. Turton's Land and Fresh Water Shells, is only a variety of this species.

4. *CLAUSILIA ROLPHII*, pl. IV, f. 39, 40.

Clausilia Rolphii, Leach, MSS.; Ib., Mollusc. ined., p. 119; Féruccac, Journ. Phys., 1820, p. 301; Alder, Mag. Zool. and Bot., II, p. 111; Turton, Man., p. 71, f. 54; *Clausilia Iphigenia Rolphii*, Gray, Med. Rep., 1821, p. 182; Ib., Ann. Phil., p. 15; Turton, Man., p. 71, f. 54; *Clausilia plicatula*, Drapernaud, Hist. des Moll., p. 74, pl. 4, f. 17, 18; Rossomassler, Icon., p. 39, pl. 2, f. 32; Jeffreys, Linn. Tr., XVI, p. 353; Brard, p. 85, pl. 3, f. 10; *Clausilia Rolphii*, Brown, Illust. Conch., p. 38, pl. 18, f. 31.

Shell thin, opaque, ventricose in the middle, of a grayish-brown horn-colour; body very short; spire very long, consisting of nine or ten rather narrow volutions, each of which are somewhat inflated in the centre, and terminating in an obtuse apex; the whole surface covered with close-set, elevated, longitudinal striae; aperture subovate, sinuous at the outer and upper angles; outer and inner lips white, thick, and detached all round; provided with four or five plaits on the columellar, two of which are longer than the others.

This species is subject to the following very distinct varieties:

1. With four plaits, the middle ones less than the others.
2. With five plaits, the three middle ones less than the others.
3. With five plaits, the three lower ones less than the others.

Found first in Britain by Mr. Rolph, in Charlton Wood, Kent; and Mr. Gray has met with it at Hastings, Sussex. Its habitat is in damp woody situations, among moss, and on the trunks of trees.

5. *CLAUSILIA DUBIA*, pl. IV, f. 41, 42.

Clausilia dubia, Drapernaud, Hist. des Moll., p. 142, pl. 4, f. 10; Alder, Mag. Zool. and Bot., II, p. 111; Brown, Illust.

Conch., p. 39, pl. 18, f. 32; *Clausilia rugosa*, var., Alder, l. c., p. 32; *Clausilia similis*, Gilbertson, MSS.

Shell dark umber-brown, ventricose; body long; spire small, consisting of from nine to eleven rather inflated volutions; covered with pretty strong, elevated, somewhat granular striæ, in consequence of a few spiral ridges on the lower volutions; aperture oblong-ovate, contracted above, and a little rounded below; lips white, rather narrow; columella with two plaits, the superior one placed near the upper portion of the aperture and pointing downwards, the lower one near the under side, internally bifurcate, and pointing upwards. Size, about five-eighths of an inch long, and one-eighth in diameter.

It is known from *Clausilia rugosa* by being longer, and more ventricose.

Found in the North of England, under moss in rocky situations.

GENUS XVIII.—PUPA.—Lamarck.

Shell oblong, cylindrical, thick; spire with numerous volutions, terminating in an obtuse apex; aperture elliptical for the most part, sometimes a little square at the upper extremity, and rounded anteriorly; peretreme and inner lip continuous, slightly thickened, and reflected; upper part of the aperture frequently provided with a single tooth within: many of the species furnished with longitudinal ribs.

The young shells of the genus *Pupa* are trochiform, with a simple cavity at the base. Mr. Alder first pointed out a remarkable structure in the interior of *Pupa umbilicata* and *P. Anglica*. This consists of a raised thread-like laminar process winding spirally round the columella, and a similar lamina running spirally on the upper side of the volutions, with a series of small, flat, nearly transverse, testaceous plaits, situate at intervals, in the interior of the volutions. These are somewhat analogous to the septa in the genus *Segmentina*. These plaits are not, however, continued through the lower volutions. Their use has not yet been ascertained.

1. PUPA MUSCORUM, pl. V, f. 1.

Pupa muscorum, Drapernaud, Hist. des Moll., p. 59, var. a; Pfeiffer, I, p. 57, pl. 3, f. 17, 18; *Pupa delucida*, Rossmassler,

VI, p. 15, pl. 23, f. 326; *Bulimus muscorum*, Bruguière, Ency. Meth., p. 334, No. 63; *Helix muscorum*, Müller, Verm. Hist., II, p. 105, No. 304; *Turbo muscorum*, Linnæus, Syst. Nat., p. 1240, No. 651; Chemnitz, Conch., IX, pl. 3, f. 3; Maton and Rackett, Linn. Tr., VIII, p. 182; Turton, Brit. Fau., p. 184; Donovan, Brit. Sh., III, pl. 80; *Pupa muscorum*, Brown, Illust. Conch., p. 39, pl. 14, f. 7.

Shell subcylindrical, smooth, glossy; body somewhat shorter than the spire, which consists of four rather broad volutions, gradually tapering to a somewhat obtuse apex; aperture subovate, destitute of teeth; outer lip white, rather narrow above, but widening a little below; pillar lip narrow; whole surface of a fulvous brown-colour.

Found at the Rabbit Burrow, Portmarnock, Ireland; near Weymouth, Dorsetshire; at Corstorphin Hill, near Edinburgh, and in the park of the Earl of Rothes, near Leslie, Fifeshire, on the bark of trees and among moss.

This seems the true *P. muscorum* of Linnæus; and I cannot agree with Rossmassler and other modern authors, in considering the *P. unidentata* and *bidentata* as varieties of this species.

2. PUPA UNIDENTATA, pl. V, f. 2.

Pupa unidentata, Pfeiffer, Land un Was. Sn., I, p. 58, pl. 3, f. 19, 20; Brown, Illust. Conch., p. 39, pl. 14, f. 4; Ib., First Ed., pl. 41, f. 4; *Pupa muscorum*, Gärt. Conchyl. der Wetterau, S. 20; Rossmassler, I, p. 83, pl. 2, f. 37; *Turbo muscorum*, V. Alten, Erd-und Flussconchyl., un Augsb., S. 23.

Shell smooth, brownish horn-coloured, subcylindrical; consisting of seven narrow, slightly inflated volutions, terminating in an obtuse apex; aperture suborbicular, sublunate above, with a single sharp, prominent tooth placed on the base of the body, margins white and smooth. Length a little more than an eighth of an inch; diameter a third of its length.

Distinguished from *P. marginata* by the single tooth being more acute, and placed farther forward.

Found with other species of *Pupa* at Portmarnock Rabbit Burrow, Ireland.

3. PUPA BIDENTATA, pl. V, f. 3.

Pupa bidentata, Pfeiffer, I, p. 59, pl. 3, f. 21, 22; Brown, Illust. Conch., p. 39, pl. 14, f. 6; Ib., First Ed., pl. 41, f. 6.

Shell ovate, ventricose; body and spire of nearly equal length; the latter consisting of four considerably inflated volutions, the three superior ones rapidly diminishing, and terminating in a rather sharp apex; aperture subovate; outer lip slightly reflected, and white; pillar lip narrowly reflected on the columella, with a narrow subumbilicus behind it; whole surface covered with a chestnut-brown epidermis. Length not two lines; diameter equal to two-thirds its length.

Found at Portmarnock, Ireland.

This species is much shorter, in proportion to its breadth, than the *P. marginata*, and is always destitute of the rib behind its outer lip.

Notwithstanding the opinion of Rossmassler and other authors, I always have considered that the *P. muscorum*, *unidentata*, and *bidentata* are distinct species; for besides the dentition, the following distinctions will be found in the three nearly allied species of this genus. In *P. muscorum* the shell is subcylindrical, the whole volutions a little more oblique than in the other species, and gradually decreasing, with the apicial one rather obtuse; and the body and first volution longer. *P. unidentata* is nearly cylindrical, the volutions are more transverse, the three apicial ones diminishing more abruptly, with the superior one more pointed. *P. bidentata* is altogether a shorter shell in proportion to its breadth.

4. PUPA MARGINATA, pl. V, f. 4, 5.

Pupa marginata, Drapernaud, Hist. des Moll., p. 61, pl. 3, f. 36, 37, 38; Pfeiffer, Land un Was. Sn., I, p. 59, pl. 3, f. 23, 24; Brard, p. 93, pl. 3, f. 15, 16; Turton, Man., p. 98, f. 79; Jeffreys, Linn. Tr., XVI, p. 358; Thompson, Ann. and Mag. Nat. Hist., VI, p. 25; Forbes, Mal. Mon., p. 11; *Pupa muscorum*, Lamarck, VI, p. 111; Rossmassler, VI, p. 15, pl. 23, f. 5; *Turbo muscorum*, Brown, Ency. Brit., 6th Ed., VI, p. 457; *Turbo marginata*, Sheppard, Linn. Trans., XIV, p. 154; *Pupilla marginata*, Leach, Moll., p. 127; *Alæa marginata*, Jeffreys, Linn. Tr., XVI, p. 357; *Pupa marginata*, Brown, Illust. Conch., p. 39, pl. 18, f. 33, 34.

Shell glossy, subpellucid, cylindrical, of a chestnut-brown colour; body about a third of the length of the shell; spire consisting of five or six slightly inflated, convex volutions, well

defined by the sutural line, and terminating in an obtuse apex; aperture nearly orbicular, with a single, small, tubercular tooth, situate far back, at the central part of the aperture, on the front of the body volution; lips white, continuous, with a whitish rib placed externally behind the outer lip, but which is nearly obsolete in some specimens; lip thin and emarginate, slightly reflexed, with a small subumbilicus placed behind it. Length somewhat more than an eighth of an inch; diameter about a third its length.

This species is pretty generally diffused throughout Great Britain and Ireland, inhabiting mossy banks or under stones, in the crevices of rocks or on old walls; and also under the bark on decayed trees.

Found at Castletown, Isle of Man, by my friend Edward Forbes, jun., Esq.

5. PUPA UMBILICATA, pl. V, f. 6.

Pupa umbilicata, Drapernaud, p. 62, pl. 3, f. 39, 40; Lamarck, An. San. Vert., VI, pt. 2nd, p. 111; Jeffreys, Linn. Tr., XVI, p. 357; Rossmassler, pl. 23, f. 327; Alder, Mag. Zool. and Bot., II, p. 111; Thompson, Ann. and Mag. Nat. Hist., VI, p. 37; *Pupa muscorum*, Fleming, Brit. An., p. 268; *Pupilla Drapernaudii*, Leach, Moll., p. 126; *Turbo muscorum*, Montagu, Test. Brit., p. 335, pl. 22, f. 3; Brown, Ency. Brit., 6th Ed., VI, p. 457; *Helix umbilicata*, Daudeb, Hist. des Moll., No. 474; *Odostomia muscorum*, Fleming, Edin. Ency., VII, p. 76; *Jaminia muscorum*, Risso, E. M., IV, p. 88; *Pupa umbilicata*, Brown, Illust. Conch., p. 40, pl. 14, f. 5; Ib., First Ed., pl. 41, f. 5.

Shell cylindrical, ventricose, smooth, subpellucid, glossy, pale brownish horn-colour; body and spire nearly of equal length, the latter consisting of five or six narrow, considerably inflated volutions, terminating in a subacute apex; aperture elongated, subluniform; outer and pillar lips rather broad, white, and slightly reflexed, with a single, large, laminar tooth at the superior outer angle of the aperture, and appears to be formed by an inflected prolongation of the outer lip; behind the columellar lip is a rather large umbilicus, bounded by a circular rib. Length somewhat more than the eighth of an inch; diameter about a third of its length.

Found on old walls, under stones, and the bark of trees, in many parts of Great Britain and Ireland; it is abundant in the latter country, as well as all its islands, especially where limestone and chalk prevail.

6. PUPA ANGLICA, pl. V, f. 7, 8.

Pupa Anglica, Potiez and Michaud, Gal., I, p. 195, pl. 20, f. 1, 2; Alder, Mag. Zool. and Bot., II, p. 111; Thompson, Ann. and Mag. Nat. Hist., VI, p. 38; Brown, Illust. Conch., p. 40, pl. 18, f. 35, 36; *Pupa ringens*, Jeffreys, Linn. Tr., XVI, p. 356; *Pupa tridentalis*, Michaud, Compl., p. 61, pl. 15, f. 28, 30; *Vertigo Anglica*, Féruccac, Moll.; Turton, Man., p. 102, f. 82; *Turbo Anglicus*, Wood, Cat. Sup., pl. 6, f. n.

Shell ventricose, glossy; body short; spire long, consisting of five or six inflated volutions, well defined by the suture, the two superior ones decreasing in size rather suddenly; aperture somewhat elliptical, provided with five teeth, two on the base of the body, one of them central, and the other small and tubercular, one at the superior portion of the outer angle, parallel with, and united to the outer lip, and so much curved, as nearly to unite with a tubercle which is situate near the top of the outer lip, and forming a nearly circular area betwixt them; and an oblique, rather sharp tooth situate on the columella; outer lip flattened in front, reflected, and of a brownish hue; pillar lip broad, with a deep circular umbilicus behind it; whole shell with slight, longitudinal striae, and covered with a dark reddish-brown or chocolate-coloured epidermis, and frequently grayish towards the apicial region. Length two lines; diameter one line.

This interesting species, long considered as peculiar to England, inhabits woody situations, and has been found in various localities, namely, near Bristol, Exeter, Lancashire, and Twizil House, Northumberland; in Scotland it has been met with in a wood at Corstorphin, near Edinburgh, and at Ballantrae, Ayrshire, by Mr. Thompson of Belfast; who also found it in the County of Londonderry, Ireland, at the side of the river Bann, near its junction with the ocean, also in numerous localities throughout Down and Antrim, and on the mountain of Benbulben in Sligo, glen of the Downs, Wicklow, and at the lower lake of Killarney; Mr. W. H.

Harvey found it near Ballitore, and on sand hills at Miltown Malbay. In short, it seems universally diffused throughout Ireland.

7. PUPA JUNIPERI, pl. V, f. 9.

Pupa secale, Drapernaud, p. 64, pl. 3, f. 49, 50; Pfeiffer, I, p. 55, pl. 3, f. 14; Jeffreys, Linn. Tr., XVI, p. 353; Ross-massler, Icon., p. 82, pl. 2, f. 35; Alder, Mag. Zool. and Bot., II, p. 111; *Turbo juniperi*, Montagu, Test. Brit., p. 340, pl. 12, f. 12; Brown, Ency. Brit., 6th Ed., VI, p. 457; Turton, Brit. Fau., p. 185; *Abida secale*, Leach, Moll., p. 165; *Vertigo secale*, Turton, Man., p. 101, pl. 7, f. 81; *Chondrus secale*, a, Hartmann, p. 218, No. 20; Sturm, VI, p. 7, pl. 4; *Torquilla secale*, Studer, Catal., p. 19; *Cochlodonta secale*, Féruccac, Prod., p. 64; *Pupa juniperi*, Brown, Illust. Conch., p. 40, pl. 14, f. 1; Ib., First Ed., pl. 41, f. 1.

Shell subcylindrical; body not quite a third of the length of the shell; spire consisting of seven or eight somewhat inflated, but narrow volutions, well defined by the sutural line, the four apicial ones tapering rather abruptly, and terminating in a blunted apex; aperture somewhat square above and rounded below, and provided with seven or eight laminar teeth, two of which are placed on the pillar lip, three on the base of the body, the central one situate far back, and that next the outside long, sharp, standing obliquely inwards, and obtruding in front of the others, and three on the outer lip, the central one largest, and the lower one deeply seated; all the teeth of the outer lip are visible externally, shining through in the form of three pale, slightly spiral bands; outer lip white, acute, broad below, with a slight wave or sinus above, and reflected; pillar lip continuous with the outer one, and reflected, with an umbilicus behind; whole surface subopaque, of a dull grayish-brown colour, and covered with very fine, regular, longitudinally oblique striae. Length upwards of a quarter of an inch; diameter equal to about a third of its length.

This species lives chiefly in districts where the chalk or Oolitic rocks prevail, its habitat being the roots of trees, and under stones, in dry situations.

In the young condition the shell has an earthy covering, and in this state is the *Helix ventricosa* of Müller.

GENUS XIX.—VERTIGO.—Müller.

Shell subcylindrical, subfusiform, thin and transparent; volutions narrow, appearing as if squeezed together, gradually decreasing in size, and becoming abruptly obtuse at the apex; aperture contracted, sinuated, somewhat angular, toothed internally, marginated; outer lip subreflected and simple.

Section I.—Shells dextral, nearly cylindrical; aperture externally margined.

1. VERTIGO EDENTULA, pl. V, f. 10.

Pupa edentula, Drapernaud, p. 59, pl. 3, f. 28, 29; Alder, Mag. Zool. and Bot., II, p. 112; Rossmassler, X, p. 28, pl. 49, f. 646; Turton, Man., p. 99, pl. 7, f. 80; Thompson, Ann. and Mag. Nat. Hist., VI, p. 39; *Vertigo nitida*, Féruccac, Tab. Moll., p. 64; *Alæa nitidi*, Jeffreys, Linn. Tr., XVI, p. 358; *Alæa revoluta*, Jeffreys, Linn. Tr., XVI, p. 515 and 558; *Turbo oftenensis*, Sheppard, Linn. Trans., XIV, p. 155; *Turbo edentula*, Wood, Cat. Sup., pl. 6, f. 14; *Vertigo edentula*, Brown, Illust. Conch., p. 41, pl. 18, f. 36.

Shell ovately conical, or subcylindrical, somewhat ventricose, of a transparent horn-colour; spire consisting of four or five well rounded volutions, which are deeply divided by the sutural line, and terminate in a slightly obtuse apex; the whole covered with nearly obsolete striæ; aperture semicircular, destitute of teeth; outer lip thin on the edge, without a rib behind; with a very minute umbilicus. Length a tenth of an inch.

Found in many localities in Great Britain and Ireland. Its favourite resort is marshy situations. Mr. Thompson says, “The typical form of *V. edentula* I generally find under stones; the elongated and cylindrical variety in woods—in autumn and winter this latter is most readily obtained on the fallen leaves of trees; in summer on the under side of the fronds of ferns.”

The elongated variety has not unfrequently seven or eight volutions, and is often one and a half line in length.

2. VERTIGO PYGMÆA, pl. V, f. 11.

Vertigo pygmæa, Féruccac, Tab. Moll., p. 64; Turton, Man., p. 103, f. 83; Alder, Mag. Zool. and Bot., II, p. 112; Thompson, Ann. and Mag. Nat. Hist., VI, p. 40; *Vertigo vulgaris*, Leach, Moll., p. 129; *Pupa pygmæa*, Drapernaud, p. 60, pl. 3,

f. 30, 31; Forbes, Mal. Mon., p. 12; *Turbo sexdentatus*, young shell, Montagu, p. 337; *Alœa vulgaris*, Jeffreys, Linn. Tr., XVI, p. 359; *Helix Isthima*, Gray, Med. Rep., 1821, p. 239; *Vertigo pygmæa*, Brown, Illust. Conch., p. 41, pl. 18, f. 37.

Shell ovoid, somewhat ventricose, of a glossy, semipellucid, dark reddish-brown colour; spire composed of three or four almost smooth, rather ventricose volutions, the apical one abruptly smaller than that below it; aperture sublunate, provided with five teeth, two of which are situate on the columella, the upper one largest, one on the base of the body or superior portion of the aperture, and two on the outer lip, which, with the inner lip, is thin and externally margined, and a little reflected, with a minute subumbilicus behind the columellar lip; outer lip with a longitudinal rib externally.

Found in almost all parts of Great Britain and Ireland, although not numerous in any one locality; its favourite resort is under stones in dry situations, as far as our experience has gone; but Mr. Thompson, an accurate observer of nature, says, he has found it both in wet and dry situations, from the sea shore to elevated mountain localities. Mr. Forbes met with it among grass at Douglas, Isle of Man.

3. VERTIGO CYLINDRICA, pl. V, f. 12.

Vertigo cylindrica, Féruccae, Tab. Moll., p. 65; Alder, Mag. Zool. and Bot., II, p. 112; *Pupa obtusa*, Fleming, Brit. An., p. 269; *Pupa muscorum*, var. *a*, Drapernaud, p. 59, pl. 3, f. 36, 37; *Pupa minutissima*, Hartmann, Neue Alpina, p. 220, pl. 2, f. 5; Pfeiffer, III, p. 38, pl. 7, f. 12, 13; Rossmassler, I, p. 84, pl. 2, f. 38; *Vertigo cylindrica*, Brown, Illust. Conch., p. 41, pl. 18, f. 38.

Shell cylindrical, pellucid, pale yellowish-brown; spire consisting of four convex, acutely and obliquely striated volutions; aperture ovate, slightly margined externally, and destitute of teeth; outer lip rather thin, with a narrow and small umbilicus situate behind the columellar lip. Not quite a line in length.

Found near the Village of Balmenna, Fifeshire, by my friend Mr. Chalmers, surgeon, Kirkealdy. Its habitat is under stones.

4. VERTIGO SEXDENTATA, pl. V, f. 13.

Vertigo sexdentata, Turton, Man., p. 103, f. 84; *Vertigo 4, 5 dentata*, Studer, Catal.; *Vertigo substriata*, Alder, Cat.

Sup. Trans. Newcastle Nat. Hist. Soc., p. 34; Ib., Mag. Zool. and Bot., II, p. 112; Thompson, Ann. and Mag. Nat. Hist., VI, p. 40; *Turbo sexdentatus*, Montagu, Test. Brit., p. 59, f. 8; Brown, Ency. Brit., 6th Ed., VI, p. 457; Turton, Brit. Fau., p. 184; *Helix minuta*, Müller, Verm., II, p. 101; *Vertigo sexdentata*, Brown, Illust. Conch., p. 41, pl. 14, f. 8.

Shell subcylindrical, ventricose, subconic above, smooth, glossy, of a brownish-yellow horn-colour; spire consisting of four slightly inflated volutions, terminating in a rather obtuse apex; aperture sublunate, a little margined externally; with a thin, reflexed, slightly bent outer lip, which is usually provided with four teeth, two on the upper portion of the aperture, the right one the larger, and two on the columellar lip. Length one line; diameter half its length.

Found in moist situations in Cornwall, Devonshire, Suffolk, at Preston, Lancashire, Newcastle-upon-Tyne, and at Ballantrae, Ayrshire. It is widely diffused throughout Ireland, although rare where it is met with.

5. VERTIGO PALUSTRIS, pl. V, f. 14.

Vertigo palustris, Leach, Moll., p. 128, pl. 8, f. 10; Turton, Man., p. 104; Alder, Mag. Zool. and Bot., II, p. 112; Thompson, Ann. and Mag. Nat. Hist., VI, p. 40; Brown, Illust. Conch., p. 41, pl. 18, f. 39; *Alcea palustris*, Jeffreys, Linn. Tr., XVI, p. 360; *Pupa antivertigo*, Drapernaud, p. 60, pl. 3, f. 32, 33.

Shell oblong-ovate, subcylindrical, of a deep chestnut, glossy brown-colour; spire subconic, composed of four volutions, slightly inflated, and well defined by the sutural line; body fully longer than the spire; aperture sublunate, with the margins whitish, somewhat sinuated, and provided with eight unequal teeth, three of which are situated on the outer lip, three on the superior portion of the columella, and two on the columellar lip; outer lip with a considerable subsinus near its centre.

This species has sometimes a ninth tubercular tooth. It is somewhat smaller than the *V. sexdentatus*.

The *V. palustris* may be easily distinguished by the three distinct, white teeth, which are situate within the upper and truncated portion of the aperture.

Found in marshy situations, in the neighbourhood of Sear-

borough; Wimbledon Common; near Twizil House, Northumberland, the seat of J. P. Selby, Esq.; and in Ireland, in many localities throughout the Counties of Down and Antrim, Portarlington, County of Kildare, and Finnoe, County of Tipperary; and at Ballantrae, Ayrshire, Scotland.

6. VERTIGO ALPESTRIS, pl. V, f. 15.

Vertigo Alpestris, Féruccac, MSS.; Alder, Mag. Zool. and Bot., II, p. 112; Brown, Illust. Conch., p. 42, pl. 18, f. 40.

Shell subcylindrical, pellucid, of a pale yellowish horn-colour; spire provided with four somewhat ventricose volutions, gradually tapering to a rather obtuse apex; whole surface covered with longitudinal, minute striæ; aperture semicircular, provided with five teeth, one of which is situate on the superior portion of the aperture, two on the columella, and two on the outer lip, which is slightly reflected. Length one-tenth of an inch; diameter half its length.

Found on old walls, in Northumberland, near Newcastle-upon-Tyne, by Joshua Alder, Esq.

This species differs from *V. pygmæa* in being slightly striated, and somewhat more cylindrical.

Section II.—Shell fusiform and subcylindrical; spiral convolutions sinistral; aperture externally margined.

7. VERTIGO PUSILLA, pl. V, f. 16.

Vertigo pusilla, Müller, Verm., II, p. 124, No. 320; Alder, Mag. Zool. and Bot., II, p. 112; Jeffreys, Linn. Tr., XVI, p. 361; Pfeiffer, I, p. 72, pl. 3, f. 45, 46; Thompson, Ann. and Mag. Nat. Hist., VI, p. 41; *Vertigo heterostropha*, Leach, Moll., p. 130; *Pupa vertigo*, Drapernaud, p. 61, pl. 3, f. 34, 35; *Jaminea heterostropha*, Risso, IV, p. 91; *Helix vertigo*, Gmelin, Linn. Syst. Nat., I, p. 3654, No. 155; Schröter, Flussconchyl., S. 349; *Vertigo pusilla*, Brown, Illust. Conch., p. 42, pl. 18, f. 41.

Shell ventricose, ovate, brittle; volutions heterostrophe; body and spire about equal in length; the latter consisting of four somewhat ventricose, nearly transverse volutions, terminating in a rather obtuse apex; aperture subtriangular, oblique, situate on the right side of the shell; provided internally with two teeth on the superior portion of the peristome, two on the

columellar lip, and three on the outer lip; peretreme narrow, white, a little reflected, with a small umbilicus behind the columellar lip; outer lip furnished with a longitudinal rib internally, and two or three transverse, pale lines, being the reflections of teeth within the aperture, and with a very slight wave; whole shell subpellucid, of a pale chestnut horn-colour, and with longitudinal, very minute striæ, which are only perceptible by the aid of a very strong lens. Length a line; diameter not half its length.

This species has, in some few instances, an eighth tooth situated on the pillar lip.

Inhabits moist woody situations, under stones. It is not a rare, although a local species in Britain. Mr. Thompson, however, says, it is very rare in Ireland, and has been met with in the north-east and west of the island. He particularises Colin Glen, near Belfast, Portmarnock, and Miltown Malbay.

8. *VERTIGO ANGUSTIOR*, pl. V, f. 17.

Vertigo heterostropha, Leach, Moll., p. 130; *Vertigo angustior*, Jeffreys, Linn. Tr., XVI, p. 361; Alder, Mag. Zool. and Bot., II, p. 112; Thompson, Ann. and Mag. Nat. Hist., VI, p. 41; Brown, Illust. Conch., p. 42, pl. 14, f. 9; Ib., First Ed., pl. 41, f. 9; *Turbo vertigo*, Montagu, Test. Brit., p. 363, pl. 12, f. 6; Turton, Brit. Fau., p. 186.

Shell ventricose in the middle, and tapering to both extremities; with four heterostrophe volutions, nearly flat on the sides, and terminating in an obtuse apex; body about a third of the entire length of the shell; aperture subtriangular, contracted and angular on its left superior side, rather rounded below; peristome white, and somewhat thickened; outer lip thickened, slightly waved; three white teeth, two of which are on the columella, and one on the outer lip; whole shell covered with fine, obliquely longitudinal striæ, and of an opaque, pale umber-brown colour. Length about half a line.

This is a rare species, and is mentioned by Montagu as obtained from the rejectamenta of the river Avon, Wiltshire; Jeffreys gives its habitat in the rejectamenta of a small stream at Marino, near Swansea; and Thompson obtained it from Mr. W. H. Harvey, who found it at Miltown Malbay, Ireland.

In pointing out the difference between this species and *V.*

pusilla, Jeffreys says, that the back being more sunk in some species than in others,—which characterises the growth of toothed land shells,—is sufficient proof that it is not the young of *V. pusilla*.

GENUS XX.—AZECA.—Leach.

Shell subcylindrical, somewhat obtuse; covered with a pellicular, glossy epidermis; aperture pyriform, oblique, curved, and contracted, and terminating in a point above; peristome thick, obtuse, united all round, and toothed internally; columella imperforated.

1. AZECA TRIDENS, pl. V, f. 18.

Azeaca Matoni, Leach, Moll., p. 122, pl. 8, f. 8; Turton, Man., p. 68, f. 52; *Pupa Goodalli*, Féruccac, Prod., p. 71; Alder, Cat., p. 32; Ib., Mag. Zool. and Bot., II, p. 110; *Azeaca Britannica*, Kenyon, Mag. Nat. Hist., II, p. 426, f. n.; *Turbo tridens*, Montagu, Test. Brit., p. 338, pl. 11, f. 2; Maton and Rackett, Linn. Tr., VIII, p. 181; Turton's Linné, IV, p. 499; Ib., Brit. Fau., p. 184; Brown, Ency. Brit., 6th Ed., VI, p. 456; *Pupa tridens*, Lamarck, An. San. Vert., VI, pt. 2nd, p. 108; *Helix tridens*, Müller, Verm., II, p. 106, No. 305; *Azeaca tridens*, Brown, Illust. Conch., p. 42, pl. 14, f. 2; Ib., First Ed., pl. 41, f. 2.

Shell subcylindrical, subpellucid, glabrous, glossy, and of a horn-colour; body not quite so long as the spire, which consists of five or six slightly inflated volutions, terminating in a somewhat obtuse apex, with some minute longitudinal striae near the suture; aperture pyriform, oblique, a little curved; columella slightly reflexed, with two long and two short teeth alternating; outer lip with a single tooth on its margin. Length a quarter of an inch.

Inhabits close, shaded, woody situations, among moss, under stones, and among decayed leaves, &c.

GENUS XXI.—HELIX.—Linnæus.

Shell orbicular, or subglobose, thin; body very large; spire short, and small in proportion to the body; aperture oblique; outer lip reflected, and interrupted by the bulging of the body;

columella confluent with the outer lip, and situate on the lower portion of the axis. Some species are umbilicated, and others not so; destitute of an operculum.

Several species, however, have the power of forming a calcareous lid, fitting the aperture, to the external edges of which, the animal firmly cements it after retiring to its hybernaculum in winter. This lid has been termed by some authors an epiphragm.

This genus has been divided into several sub-genera.

Sub-Genus 1.—HELICOGENA.—Férussac.

Body volution large; axis solid; destitute of an umbilicus; aperture large.

1. *HELIX POMATIA*, pl. VI, f. 1, 2, 3.

Helix Pomatia, Linnaeus, Syst. Nat., p. 1244; Gmelin, Linn. Syst., p. 3627; Lister, Conch., pl. 48, f. 46; Pennant, Brit. Zool., IV, p. 134, pl. 84, f. 128; *Cochlea Pomatia*, Da Costa, Brit. Sh., p. 67, pl. 4, f. 14; Donovan, Brit. Sh., III, pl. 84; Müller, Verm., II, p. 43, No. 243; Turton's Linné, IV, p. 513; Ib., Man., p. 44, pl. 4, f. 34; Ib., Brit. Fau., p. 190; Montagu, Test. Brit., p. 408; Brard, p. 19, pl. 1, f. 5; Drapernaud, Hist. des Moll., p. 87, pl. 5, f. 20, 21, 22; Pfeiffer, I, p. 25, pl. 2, f. 9; Brown, Ency. Brit., 6th Ed., VI, p. 458; Ib., Ency. Edinensis, II, p. 554, pl. 55, f. 5; Alder, Mag. Zool. and Bot., II, p. 106; *Pomatia antiquorum*, Leach, Moll., p. 89; *Helix Pomatia*, Brown, Illust. Conch., p. 43, pl. 16, f. 12 and 14; Ib., First Ed., pl. 39, f. 12 and 14.

Shell subglobose, rather strong; body very large, ventricose; spire small, consisting of four somewhat inflated, well divided volutions, terminating in an obtuse apex; whole shell with rather strong, longitudinal striae, and crossed by very minute, spiral striae, but not so strong as to produce a reticulated appearance; aperture nearly sublunate; pillar lip white, or very pale rose-colour, considerably spread over the columella; outer lip slightly reflected, and somewhat thickened on the margin; whole shell covered with a thin yellowish-brown epidermis, with three or four broad, transversely spiral, reddish-brown bands beneath it on the body volution, and generally one narrow band on the superior volutions; inside of aperture pale brownish-

purple. Length generally about two inches; diameter not quite so much.

The favourite habitats of this species are hedges, woods, and chalky soil. It does not extend further north in England than the midland counties.

Fig. 3 represents the young shell.

The *H. Pomatia* is the largest of the British land shells, and is subject to some variety, both as regards colour and size, and relative proportion of the spire to the body. Reversed specimens have been met with, and others with the convolutions disunited and scalariform.

This shell has, by some authors, been supposed not an aboriginal species, but to have been introduced from Italy about the middle of the sixteenth century by a Mr. Howard, and first turned out at Albury, in Surrey. They seem to have increased much, and spread themselves over most of the southern counties. We are, however, of opinion that it is a native of England.

This species was a favourite food with the ancient Romans, and is eaten in many parts of Europe at the present time.

2. HELIX ASPERSA, pl. VI, f. 4, 5, 6, 7.

Helix aspersa, Müller, Verm., II, p. 59, No. 253; Gmelin, Linn. Syst., p. 3631, No. 58; Lister, Conch., pl. 49, f. 47; Turton's Linné, IV, p. 515; Montagu, Test. Brit., p. 409; Drapernaud, p. 89, pl. 5, f. 23; Brard, p. 7, pl. 1, f. 1; Brown, Ency. Brit., 6th Ed., VI, p. 460; Fleming, Edin. Ency., VII, p. 81; Ib., Brit. An., p. 263; Turton, Man., p. 52, f. 35; Leach, Moll., p. 82; Rossmassler, pt. 5th, p. 5, pl. 22, f. 294, and small var. *Mazzublia*, p. 5, pl. 22, f. 296; Jeffreys, Linn. Tr., XVI, p. 328; Alder, Mag. Zool. and Bot., II, p. 106; Thompson, Ann. and Mag. Nat. Hist., p. 20; Forbes, Mal. Mon., p. 7; *Helix hortensis*, Pennant, Brit. Zool., IV, p. 136, pl. 84, f. 129; Turton, Brit. Fau., p. 191; Brown, Wernerian Mem., II, p. 527; Donovan, Brit. Sh., IV, pl. 131; *Cochlea vulgaris*, Da Costa, p. 72, pl. 4, f. 1; *Helix aspersa*, Brown, Illust. Conch., p. 43, pl. 16, f. 5, 13, and 17; Ib., First Ed., pl. 39, f. 5, 13, and 17.

Shell subglobose; body large; spire small, consisting of four nearly parallel, rather tumid, but narrow volutions, terminating in a somewhat obtuse apex; aperture semilunar, a little longi-

tudinally lengthened; inner lip white, pretty broadly reflected on the columella; outer lip blunted on the edge, and considerably reflected; whole surface covered with a rather strong, dull, wrinkled epidermis, of a yellowish-brown or olive; with two or three dark, reddish-brown bands of large, interrupted, irregular blotches on the body volution, and two or three on the volutions of the spire; between these are paler, irregular markings. Diameter about an inch and a half.

When the epidermis is removed, the surface of the shell is of a pale white, marked with the fasciæ, which appear more distinct.

Fig. 7 represents the young shell.

This species is subject to considerable variety, both in colour and markings, as well as in the length of its spire.

Fig. 6 is a small variety, the body of which is invested with irregular, longitudinal clouds and blotches, without fasciæ. It has been found with the volutions reversed, and also with the convolutions apart from each other.

This species is universally diffused over the whole of Great Britain and Ireland, and inhabits woody situations, but is more especially met with in gardens, where it makes considerable havoc among the plants.

3. *HELIX NEMORALIS*, pl. VI, f. 8, 9, 10, 11, 12, 13, 14, 15.

Helix nemoralis, Müller, Verm., II, p. 46, No. 246; Linné, Syst. Nat., p. 3647; Lister, Conch., pl. 57, f. 54; Montagu, Test. Brit., p. 411; Donovan, Brit. Sh., I, pl. 13; Drapernaud, p. 94, pl. 6, f. 3, 4, 5; Brard, p. 12, pl. 1, f. 2 and 4; Maton and Rackett, Linn. Tr., VIII, p. 206; Lamarck, An. San. Vert., VI, pt. 2nd, p. 81; Fleming, Brit. An., p. 264; Ib., Edin. Ency., VII, p. 81; Brown, Ency. Brit., 1st Ed., VI, p. 460; Ib., Wernerian Mem., II, p. 527; Pfeiffer, I, p. 27, pl. 2, f. 10, 11; Rossmassler, pl. 298, *a, b, var.*; Ib., VIII, p. 26, pl. 36, f. 494; Ib., pl. 10, f. 137; Turton, Brit. Fau., p. 191; Ib., Man., p. 33, f. 23; Alder, Mag. Zool. and Bot., II, p. 107; Forbes, Mal. Mon., p. 7; Thompson, Ann. and Mag. Nat. Hist., VI, p. 22; Jeffreys, Linn. Tr., XVI, p. 330; *Tachea nemoralis*, Leach, Moll., p. 84; *Cochlea fasciata*, Da Costa, p. 76, pl. 5, f. 1, 2, 3; *Helix nemoralis*, Brown, Illust. Conch., p. 43, pl. 16, f. 1, 2, 3, 7, 8, 9, 10; Ib., First Ed., pl. 39, f. 1, 2, 3, 7, 8, 9, 10.

Shell subglobose, thin, subpellucid; body very large; spire small, consisting of three narrow, slightly inflated volutions; aperture transverse, semielliptical; inner lip reflected on the base of the columella, and proceeds in nearly a straight line until it joins the outer lip, which is thickened on the edge, and reflected; both lips invariably of a dark reddish-brown; whole surface covered with a yellow, citron-coloured, flesh-coloured, or olive, thin, pellucid, glossy epidermis, which allows the fasciae to shine through. Diameter generally about an inch; height three-quarters of an inch.

This species is subject to very great variety in its colours and markings; some are plain citron, yellow, olive, or flesh-coloured, while others are furnished with from one to five dark umber, or blackish-brown bands on the body, variously disposed.

Fig. 12 represents the young shell.

This species is at once distinguished from *H. hortensis* and *hybrida*, from the outer and pillar lips being invariably of a dark brown-colour, while those of *H. hortensis* are always white, and *H. hybrida* of a pale brown, yellowish-brown, or flesh-colour.

I found the beautiful variety f. 8, at West Coates, Edinburgh. It has a very pale rose-coloured outer lip, and a white girdle round its body. It is now in the cabinet of Lady Jardine, at Jardine Hall, Dumfriesshire. Mr. Thompson says, he met with extremely large specimens of the *H. nemoralis* in the south islands of Arran, Ireland.

The *H. nemoralis* is the most common of our land shells, being almost universally diffused throughout Great Britain and Ireland. It locates in woody situations.

4. HELIX HORTENSIS, pl. V, f. 19, 20, 21, 22.

Helix hortensis, Lister, Conch., pl. 3, f. 3; Müller, Verm., II, p. 52, No. 447; Gmelin, Syst. Nat., p. 3649, No. 109; Chemnitz, Conch., IX, pl. 133, f. 1199, 1201; Montagu, Test. Brit., p. 412; Drapernaud, p. 95, pl. 6, f. 6; Lamarck, An. San. Vert., VI, pt. 2nd, p. 81; Brard, p. 16, pl. 1, f. 3; Pfeiffer, I, p. 29, pl. 2, f. 12, 13; Fleming, Edin. Ency., VII, p. 81; Ib., Brit. An., p. 264; Rossmassler, I, p. 58, pl. 1, f. 6; Turton, Man., p. 34, pl. 3, f. 24; Alder, Mag. Zool. and Bot., II, p. 106; Jeffreys, Linn. Tr., XVI, p. 330; Forbes, Mal. Mon., p. 8;

Helix nemoralis, var., Maton and Rackett, Linn. Tr., VIII, p. 206; *Cochlea fasciata*, Da Costa, p. 76, pl. 5, f. 4, 5; *Tachea hortensis*, Leach, Moll., p. 85; *Helix hortensis*, Brown, Illust. Conch., p. 44, pl. 16, f. 11, 15, 19; Ib., First Ed., pl. 39, f. 11, 15, 19.

Shell somewhat globose, thin, smooth; body large; spire small, consisting of four, a little inflated, but narrow volutions, terminating in a rather obtuse apex; aperture semielliptical; outer lip white; whole surface covered with a shining epidermis, of yellow, citron, or pale olive, with bands in some specimens, and destitute of them in others.

This species will at once be distinguished from the *H. nemoralis*, by its outer lip being invariably white, and the shell is always nearly a third smaller, and a little more globular. It is subject to great variety in the number and disposition of its bands, which are either black, or very dark reddish-brown.

It inhabits woods, hedges, and shady places, in almost all parts of Britain and Ireland, but is not so common as the *H. nemoralis*.

5. HELIX HYBRIDA, pl. V, f. 23, 24.

Helix hybrida, Peòret; Leach, MSS.; Gray's Turton's Man., p. 132, pl. 11, f. 150; Thompson, Ann. and Mag. Nat. Hist., VI, p. 21 and 64; Brown, Illust. Conch., p. 44, pl. 18, f. 27, 28; *Helix hortensis*, var., Féruccac, pl. 31; Alder, Mag. Zool. and Bot., II, p. 106.

Shell semiglobose; body large; spire small, consisting of four moderately inflated volutions, which terminate in an obtuse apex; aperture semielliptical; outer lip of a pale brownish rose-colour, the inner rib being somewhat darker than the lip, which is rather acute at the edge; whole surface of a brownish, or citron-yellow, sometimes banded, but more generally plain; the latter almost always with an indistinct, whitish band, running spirally on the upper margin of the body, and continued on the upper edge of the volutions of the spire.

This species differs in the shape of the aperture, which is more transversely ovate than that of the former two species.

It inhabits hedges and woody situations, in many parts of Britain and Ireland, but is a very local species. Mr. R. Leyland, of Halifax, found this shell of a form and size resembling

H. hortensis, locating on a small spot on the banks of the canal between Keighley and Bingley, Yorkshire.

6. *HELIX ARBUSTORUM*, pl. V, f. 25, 26, 27, 28.

Helix Arbustorum, Linnaeus, Syst. Nat., p. 1245; Gmelin, Linn. Syst., p. 3630, No. 53; Müller, Verm., p. 55, No. 248; Lister, Conch., pl. 56, f. 53; Donovan, Brit. Sh., IV, pl. 136; Montagu, Test. Brit., p. 413; Drapernaud, p. 38, pl. 5, f. 18; Lamarck, An. San. Vert., VI, pt. 2nd, p. 180; Brard, p. 65, pl. 2, f. 12; Pfeiffer, I, p. 24, pl. 2, f. 7, 8; Rossmassler, I, p. 57, pl. 1, f. 4; Fleming, Edin. Ency., VII, p. 81; Ib., Brit. An., p. 264; Brown, Ency. Brit., 6th Ed., VI, p. 458; Ib., Wernerian Mem., II, p. 525; Turton, Brit. Fau., p. 190; Ib., Man., p. 35; Alder, Mag. Zool. and Bot., II, p. 106; Forbes, Mal. Mon., p. 7; Thompson, Ann. and Mag. Nat. Hist., VI, p. 23; *Cochlea unifasciata*, Da Costa, p. 75, pl. 17, f. 6; *Arianta Arbustorum*, Leach, Moll., p. 86; *Helix Arbustorum*, Brown, Illust. Conch., p. 44, pl. 16, f. 20, 21, 22; Ib., First Ed., pl. 39, f. 20, 21, 22.

Shell subglobose, subpellucid; body large, ventricose; spire rather small, consisting of four inflated volutions, deeply defined by the line of the suture, and terminating in a rather acute apex; aperture sublunate, somewhat longer than wide; outer lip broad, white, and reflexed, with an internal rib; pillar lip broad at its junction with the body, and narrowing suddenly as it descends; surface of a cinerious colour, and in some instances of a pale yellowish hue; beautifully mottled and streaked with lines of dark chocolate-brown, with a single transverse band of brown, investing the body volution, which continues spirally at the base of the volutions of the spire, but gradually becomes imperceptible before reaching the apex.

Fig. 28 represents the young shell.

In some specimens the girdle is wanting, and the shell of a much paler colour, as in fig. 27. Sometimes the blotches and markings are of a beautiful intense chocolate-colour. I have seen specimens entirely divested of blotches or band. It is also liable to some variety in the elevation of the spire.

This is rather a local species, but is to be met with, in Britain and Ireland, from one extreme of the islands to the other.

Sub-Genus 2.—HELICIGONA.—Férussac.

Shell orbicular, depressed, equally convex both above and below; umbilicate; provided with a carina on the centre of the body; aperture transverse; lips united all round.

7. *HELIX LAPICIDA*, pl. VII, f. 1, 2, 3.

Helix lapticida, Linné, Syst. Nat., p. 1241; Gmelin, Linnae. Syst., p. 3613, No. 2; Müller, Verm., II, p. 40, No. 240; Donovan, Brit. Sh., II, pl. 29, f. 2; Pennant, Brit. Zool., IV, p. 132, pl. 83, f. 121; Drapernaud, p. 111, pl. 7, f. 35, 36, 37; Brard, p. 53, pl. 2, f. 14, 15; Fleming, Edin. Ency., VII, p. 80; Brown, Ency. Brit., 6th Ed., VI, p. 457; Rossmassler, I, p. 63, pl. 1, f. 11; *Caracolla lapticida*, Lamarck, An. San. Vert., VI, pt. 2nd, p. 99; Fleming, Brit. An., p. 258; Alder, Mag. Zool. and Bot., II, p. 109; Turton, Man., p. 66, pl. 5, f. 51; *Helicigona lapticida*, Férussac, Prod., p. 150, pl. 66,* f. 6; *Chilotrema lapticida*, Leach, Moll., p. 106; *Helix acuta*, Lister, Conch., pl. 3, f. 4; Da Costa, p. 55, pl. 4, f. 9; *Helix lapticida*, Brown, Illust. Conch., p. 45, pl. 17, f. 9, 10, 11; Ib., First Ed., pl. 40, f. 9, 10, 11.

Shell depressed, subdiscoidal, equally convex above and below; body large; spire short, consisting of five much flattened, slightly ventricose volutions, terminating in an obtuse apex; body with a central, sharp-edged carina, which emanates from the margin of the outer lip, and investing the body, continues spirally at the base of the superior volutions, and defines them by a fine thread-like ridge; whole shell with strong, wrinkled, longitudinal striae, its entire surface presenting a shagreen-like aspect; base provided with a large and deep umbilicus, exhibiting the spiral convolutions; aperture broad, subovate, with a sharp margin; outer lip white, reflexed, and continuous with the pillar lip, which is a little spread on the base of the body, and both lips disunited from the body.

This species is extremely local, and appears not to extend much further north than the centre of England. It has never been found in Ireland, according to the account of Mr. Thompson. Its favourite habitat is limestone rocks and chalky soil.

Sub-Genus 3.—AMPLEXUS.—Brown.

Shell depressed, with an orbicular aperture; peristome continuous and reflexed; epiphragm membranaceous.

8. *HELIX PULCHELLA*, pl. VII, f. 4, 5.

Helix pulchella, Müller, Verm. Hist., II, p. 30, No. 232; Drapernaud, p. 112, pl. 7, f. 33, 34; Pfeiffer, I, p. 43, pl. 2, f. 32; Brard, p. 56, pl. 2, f. 9; Alder, Mag. Zool. and Bot., II, p. 109; Thompson, Ann. and Mag. Nat. Hist., VI, p. 23; Forbes, Mal. Mon., p. 9; Rossmassler, VII, p. 5, pl. 51, f. 440; Turton, Man., p. 63, pl. 5, f. 49; *Amplexus paludosus*, Brown, Illust. Conch., 1st Ed., pl. 41, f. 76, 77; *Helix pulchella*, Brown, Ency. Brit., 6th Ed., VI, p. 459; *Helix paludosa*, Da Costa, Brit. Conch., p. 59; Walker, Test. Min. Rar., f. 22; Montagu, Test. Brit., p. 440; Maton and Rackett, Linn. Tr., VIII, p. 193, pl. 5, f. 5; Turton, Brit. Fau., p. 188; Brown, Wernerian Mem., II, p. 524; Fleming, Edin. Ency., VII, p. 80; *Turbo paludosus*, Turton, Conch. Dict., p. 228; *Zurama pulchella*, Leach, Moll., p. 108; *Helix pulchella*, Brown, Illust. Conch., p. 45, pl. 14, f. 76, 77.

Shell smooth, white, subpellucid; spire depressed, consisting of three rounded volutions, well defined by the sutural line, terminating in an obtuse apex, and very little elevated above the body; body large, elegantly rounded, with a wide and deep umbilicus at its base, exhibiting the convolutions of the spire inside; aperture circular, with an opaque, white, flattened, reflected, thickened margin; the lips not quite meeting on the base of the body. Diameter one-tenth of an inch.

This elegant little species is pretty generally diffused throughout Great Britain and Ireland. Its favourite habitat being under stones, in dry situations. It is generally more numerous in dry situations around the coast. It is exceedingly numerous at Carolina Park, near Edinburgh; also on the sand hills at Portmarnock Rabbit Burrow, and Thompson says he found it on the short pastures, in some of the islets, of Lough Strangford, Ireland. It is, however, found in inland situations.

Many authors consider this and the following species merely as varieties; but we have invariably noticed a difference in the animals.

9. *HELIX CRENELLA*, pl. VII, f. 6, 7.

Helix crenella, Montagu, Test. Brit., p. 441; *Amplexus crenellus*, Brown, Illust. Conch., 1st Ed., pl. 41, f. 78, 79; *Helix pulchella*, var., Drapernaud, p. 112, pl. 7, f. 30, 31, 32; *Helix costata*, Müller, Verm., p. 31, No. 233; Pfeiffer, I, p. 41, pl. 2, f. 31; Gmelin, Linn. Syst. Nat., I, p. 3633, No. 67; Alten, Erd-und Flussconchyl., S. 60, pl. 6, f. 11; Gärtner, Conchyl. der Wetterau, S. 26; Rossmassler, VII, p. 5, pl. 31, f. 439; Fleming, Brit. An., p. 263; *Helix pulchella*, var., Alder, Mag. Zool. and Bot., II, p. 109; Forbes, Mal. Mon., p. 9; *Turbo helicinus*, Lightfoot, Phil. Trans., 1776, pl. 3, f. 1 to 4; *Helix crenella*, Brown, Illust. Conch., p. 45, pl. 14, f. 78, 79; Ib., First Ed., pl. 41, f. 78, 79.

Shell milk-white, subopaque; spire depressed, consisting of three well defined, rounded volutions, and terminating in an acute apex, which is but little elevated above the body volution, and beautifully rounded; its base provided with a large and deep umbilicus, exposing in its cavity the inner sides of the volutions of the spire; aperture circular; the outer and pillar lips continuous, smooth, white, opaque, and reflected, but a little separated on the columella; whole surface covered by numerous, strong, regular, longitudinal, concentric ribs. Diameter one-tenth of an inch. Some specimens have a yellowish-brown epidermis.

Some authors affirm that this species is always found in damp situations, while the habitat of *H. pulchella* is constantly in dry localities. We have met with both shells plentifully in Carolina Park, near Edinburgh, and also at Portmarnock, Ireland. In the former locality, however, we always met with the two species in separate situations.

This shell is as widely spread as the *H. pulchella*, both in England and Ireland, and in the same kind of habitat. In the North of Ireland, Mr. Thompson says this species is more common on dry sea banks than the *H. pulchella*. Forbes has found the *H. crenella* on walls in the Isle of Man, and I have met with it in a similar locality, in the King's Park, at Edinburgh. I have likewise observed both specimens in damp situations, but very rarely.

Sub-Genus 4.—HELICELLA.—Férussac.

Shell depressed; base of the body provided with a large umbilicus.

10. *HELIX CANTIANA*, pl. VII, f. 8, 9, 10.

Helix Cantiana, Montagu, Test. Brit., p. 422, pl. 23, f. 1; Maton and Rackett, Linn. Tr., VIII, p. 197; Turton, Brit. Fau., p. 189; Brown, Ency. Brit., 6th Ed., VI, p. 457; Fleming, Edin. Ency., VII, p. 79; Ib., Brit. An., p. 261; *Teba Cantiana*, Leach, Moll., p. 94; *Helix Carthusiana*, Drapernaud, p. 102, pl. 6, f. 33; Turton, Man., p. 36, pl. 3, f. 26; Alder, Mag. Zool. and Bot., II, p. 106; Brard, p. 24, pl. 1, f. 6; Férussac, Prod., p. 43; Rossmassler, V, VI, p. 36, pl. 27, f. 364; *Helix pallida*, Donovan, Brit. Sh., V, pl. 157, f. 2; *Helix circinnata*, Rossmassler, I, p. 64, pl. 1, f. 12; *Helix Cantiana*, Brown, Illust. Conch., p. 46, pl. 17, f. 15, 16, 17; Ib., First Ed., pl. 40, f. 15, 16, 17.

Shell subpellucid, thin, generally of a yellowish-white, but sometimes lead-coloured; body large, tumid, with an obscure central band; the base and aperture of a rufous colour; spire small, subdepressed, consisting of five moderately rounded volutions; aperture semielliptical, its length and width being nearly equal; outer lip thin, but not reflected; internal rib of a pale rose-colour, or white; whole surface covered with minute, irregular, longitudinal striae; umbilicus rather small. Diameter three-quarters of an inch; height about half an inch.

Young shells are very pale in the colour, and with the epidermis slightly hispid. The adult bears some resemblance to *H. rufescens*, but may be distinguished by its greater convexity, superior size, in the striae less regular and strong, in being devoid of the subcarinated band round the body, and in the umbilicus being considerably less in proportion to its size.

This species frequents the chalk districts of Kent, and is an extremely local shell.

11. *HELIX CARTHUSIANA*, pl. VII, f. 11, 12, 13.

Helix Carthusiana, Müller, Verm., p. 15; *Helix Carthusanella*, Drapernaud, p. 101, pl. 6, f. 31, 32; Alder, Mag. Zool. and Bot., II, p. 106; Brard, p. 24, pl. 1, f. 7; Turton, Man., p. 37, f. 27; *Helix Gibsii*, Leach, in Brown, Illust. Conch., 1st

Ed.; Féruccac, Journ. de Phys., XC, p. 300; *Helix Zenobia bimarginata*, Gray, Med. Rep., 1821; *Helix rufilabris*, Jeffreys, Linn. Tr., XVI, p. 509; *Teba Carthusianella*, Leach, Moll., p. 95, pl. 8, f. 4, 5, 6; *Helix Carthusiana*, Brown, Illust. Conch., p. 46, pl. 17, f. 49, 50, 51; Ib., First Ed., pl. 40, f. 49, 50, 51.

Shell subdepressed, subpellucid, glabrous, of a grayish-brown; body large, inflated on the sides; spire very small, but little elevated, consisting of three slightly defined volutions, terminating in a subacute apex; aperture sublunate; outer lip thin on the margin, with a milk-white, transverse, rather broad band on the outside; base provided with a very small umbilicus, which is partly covered by the columellar lip.

The *H. Carthusiana* is subject to some variety, in size, thickness, and also in the consistence of the shell. One variety is smaller, and more convex.

This species inhabits the chalk districts of Sussex and Kent, among short grass; and is also common on the coast betwixt Dover and Brighton.

12. HELIX RUFESCENS, pl. VII, f. 14, 15.

Helix rufescens, Pennant, Brit. Zool., IV, p. 134, pl. 85, f. 127; Montagu, Test. Brit., p. 420, pl. 23, f. 2; Turton, Brit. Fau., p. 189; Ib., Man., p. 37, f. 28; Fleming, Edin. Ency., VII, p. 79; Ib., Brit. An., p. 261; Brown, Ency. Brit., 6th Ed., VI, p. 457; Ib., Wernerian Mem., II, p. 525; Thompson, Ann. and Mag. Nat. Hist., VI, p. 28; Jeffreys, Linn. Tr., XIII, p. 337; Féruccac, Prod., p. 44; Donovan, Brit. Sh., V, pl. 157, f. 1; Maton and Rackett, Linn. Tr., VIII, p. 196; *Helix hispida*, Donovan, V, pl. 151, f. 1; *Helix glabella*, Drapernaud, p. 102, pl. 7, f. 6; Pfeiffer, p. 34, pl. 2, f. 16; Alder, Mag. Zool. and Bot., II, p. 107; *Teba rufescens*, Leach, Moll., p. 96; *Cochlea rufescens*, Da Costa, p. 80, pl. 4, f. 6; *Helix rufescens*, Brown, Illust. Conch., p. 46, pl. 17, f. 47 and 53; Ib., First Ed., pl. 40, f. 47 and 53.

Shell subdepressed, subopaque, rufous brown; body large; spire small, consisting of five slightly elevated and moderately inflated volutions, well defined by the sutural line; centre of the body volution encompassed by a slight subcarinated girdle, of a paler colour than the rest of the shell, but which does not extend to the volutions of the spire; aperture semilunar, some-

what longer than broad; outer lip thin, slightly reflexed at the lower angle; whole surface covered with longitudinal, wrinkled striae; umbilicus large and deep. Diameter frequently nearly three-quarters of an inch. Its general dimensions smaller.

The young of this shell is destitute of hairs.

This species is liable to some variations in colour.

13. *HELIX LIMBATA*, pl. VII, f. 16, 17.

Helix limbata, Drapernaud, p. 100, pl. 6, f. 29; Féruccac, Prod., p. 43; Michaud, Compl., p. 24; Rossmassler, Icon., V, p. 35, pl. 26, f. 362; Alder, Mag. Zool. and Bot., II, p. 106; Brown, Illust. Conch., p. 46, pl. 18, f. 29, 30.

Shell suborbicular, of a white or reddish colour; body large, with an opaque, slight carina round its centre; spire about a third of the length of the body, consisting of four somewhat narrow, slightly inflated and subdepressed volutions, terminating in a rather obtuse apex; aperture sublunate, very oblique, and slightly narrowed in the centre of the outer lip, which is thin, plain, slightly reflexed, and margined with white; pillar lip a little reflexed over the umbilicus, which is rather small and narrow; whole surface very finely striated. Length nearly half an inch; diameter upwards of half an inch.

This species is subject to considerable variety in colour; being sometimes reddish-brown, and at others of a clear white.

Discovered by Mr. G. B. Sowerby on the New North Road to Barnet, near Hampstead, in a hedge row, and attached to brambles. The *H. limbata* is a native of France, Switzerland, and Germany, and has in all probability been an introduced species, as the above is the only locality where it has hitherto been noticed in Britain.

14. *HELIX FULVA*, pl. VII, f. 18.

Helix fulva, Müller, Verm. Hist., II, p. 56, No. 249; Drapernaud, p. 81, pl. 7, f. 12, 13; Pfeiffer, I, p. 23, pl. 2, f. 2; Turton, Man., p. 61, f. 47; Alder, Mag. Zool. and Bot., II, p. 108; Thompson, Ann. and Mag. Nat. Hist., VI, p. 25; *Helix trochiformis*, Montagu, Test. Brit., p. 427, pl. 11, f. 9; Turton, Brit. Fau., p. 189; Fleming, Edin. Ency., VII, p. 80; Maton and Rackett, Linn. Tr., VIII, p. 200; Jeffreys, Linn. Tr., XVI, p. 331; *Helix Trochilus*, Fleming, Brit. An., p. 260; Brown, Ency. Brit., 6th Ed., VI, p. 458; *Teba fulva*, Leach, Moll., p.

99; *Helix nitidula*, V. Alten, S. 53, pl. 4, f. 8; *Helix fulva*, Brown, Illust. Conch., p. 46, pl. 17, f. 2; Ib., First Ed., pl. 40, f. 2.

Variety 1. Shell depressed, and equally convex both above and below.

Helix Mortonii, Jeffreys, Linn. Tr., XVI, p. 332.

Variety 2. Smaller, and of a darker colour.

Helix Alderi, Alder, Mag. Zool. and Bot., II, p. 108.

Shell trochiform, thin, smooth, glossy, pellucid, of a dark-brownish horn-colour, sometimes inclining to a reddish hue; body large, ventricose; spire small, much produced, and having five inflated volutions, deeply divided by the sutural line, terminating in a rather obtuse apex; base rounded, and provided with a very small umbilicus, which is hardly perceptible in the young shell; aperture subluniform, transversely compressed, its length and breadth being equal; outer lip thin; pillar lip slightly reflected over the umbilicus. Diameter about one-eighth of an inch.

The small variety of this shell, noticed by Joshua Alder, Esq., of Newcastle, has very fine concentric striæ on its base, which is only visible by the aid of a strong lens. This variety is only one-tenth of an inch in diameter.

Inhabits woody and shaded situations, under stones, on decayed timber, and under leaves. Montagu mentions it as a Devonshire and Wiltshire shell. It has also been found in the North of England; and Thompson says it is generally distributed over Ireland, from the sea shore to mountain localities. At Wolfhill, he found thirty specimens congregated under one stone.

15. *HELIX FUSCA*, pl. VII, f. 19, 20.

Helix fusca, Montagu, Test. Brit., p. 424, pl. 13, f. 1; Brown, Ency. Brit., p. 460; Fleming, Edin. Ency., VII, p. 81; Ib., Brit. An., p. 264; Maton and Rackett, Linn. Tr., VIII, p. 209; Jeffreys, Linn. Tr., XVI, p. 329, 394, and 507; Alder, Mag. Zool. and Bot., II, p. 107; Turton, Man., p. 53, f. 36; Ib., Conch. Dict., p. 946; Ib., Brit. Fau., p. 191; Thompson, Ann. and Mag. Nat. Hist., VI, p. 24; Brown, Illust. Conch., p. 47, pl. 17, f. 25, 26; Ib., First Ed., pl. 40, f. 25, 26; *Helix Zenobia corrugata*, Gray, Med. Rep., 1821, p. 239.

Shell thin, pellucid, of a rufous horn-colour; body large, considerably inflated in the centre; spire small, subdepressed, consisting of four or five very narrow volutions; aperture semi-lunar, its breadth and length nearly equal; outer lip very thin, but not reflected; columellar lip a little reflected over the very minute perforation, instead of an umbilicus. Diameter about three-eighths of an inch; its height seldom exceeding a quarter of an inch.

Found in woody, damp situations, and is a very local and scarce species in England. It has been met with generally throughout Ireland, except in the King's County. My friend T. W. Warren, Esq., of Dublin, met with it at Kilruddery, Wicklow; by Edward Wallen, Esq., at Altadawan, Tyrone; by Miss Mary Ball, of Dublin, at Youngrove, near Youghal; by the Rev. Benjamin J. Clarke at Monivea, Galway; by W. H. Harvey, Esq., near Limerick; and in glens in the Belfast mountains by William Thompson, Esq., of Belfast.

16. *HELIX LAMELLATA*, pl. VII, f. 21.

Helix lamellata, Jeffreys, Linn. Tr., XVI, p. 333; Thompson, Ann. and Mag. Nat. Hist., VI, p. 26; Brown, Illust. Conch., p. 47, pl. 18, f. 47; *Helix Scarburgensis*, Turton, Man., p. 62, f. 48.

Shell trochiform, semipellucid, of a pale grayish horn-colour; body somewhat longer than the spire, which consists of five gradually decreasing, well defined volutions, terminating in a somewhat obtuse apex; outer lip thin; inner lip slightly reflected over the umbilicus; aperture sublunate, wider than long; base of the body tumid, generally of a paler colour than the superior portion of the shell, and provided with a small, but deep umbilicus; whole surface covered with an epidermis, which rises into a series of longitudinal, lamellated processes. Diameter about the tenth of an inch.

This species has somewhat the appearance of *H. aculeata*, but may be distinguished by the lamellar epidermis not rising into spinous processes, and in being more numerous; the spire also is pyramidal, and not conical, as in *H. aculeata*; the aperture in the latter species is more elliptical and produced, than in *H. lamellata*, and it is destitute of the internal marginal rib. Mr. Thompson says, that both the animal and shell are of a paler colour in the young, than in the adult state.

This interesting addition to our Fauna we owe to Mr. Bean, of Scarborough.

It inhabits woody situations in Yorkshire and Northumberland. It has also been found to be widely distributed in Ireland, under decayed leaves of trees, in moss, and shady and moist situations. Mr. Thompson first met with it in the Glen at Holywood House, Downshire, and afterwards in many other parts of the county, and also in Antrim; it occurs in the Glen of Downs, Wicklow, La Bergerie, Queen's County, by the Rev. J. B. Clarke; and at Dunscombe Wood and Ballinhassig Glen, near Cork, by the Rev. T. Hincks, of Cork.

17. *HELIX ACULEATA*, pl. VII, f. 22.

Helix aculeata, Müller, Verm., II, p. 81; Drapernaud, p. 82, pl. 7, f. 10, 11; Alder, Mag. Zool. and Bot., II, p. 109; Ib., Trans. Newcastle Nat. Hist. Soc., I, p. 36; Thompson, Ann. and Mag. Nat. Hist., VI, p. 25; Fleming, Brit. An., p. 262; Gmelin, Linn. Syst., p. 3638; Brown, Ency. Brit., 6th Ed., VI, p. 458; *Helix spinulosa*, Lightfoot, Phil. Trans., LXXVI, p. 166, pl. 2, f. 1 to 5; Montagu, Test. Brit., p. 424, pl. 11, f. 10; Fleming, Edin. Ency., VII, p. 80; Turton, Man., p. 43, f. 33; Ib., Brit. Fau., p. 190; Maton and Rackett, Linn. Tr., VIII, p. 201; *Teba spinulosa*, Leach, Moll., p. 100; *Helix aculeata*, Brown, Illust. Conch., p. 47, pl. 17, f. 1; Ib., First Ed., pl. 40, f. 1.

Shell conical, globose, thin, subpellucid, of a brownish horn-colour; body large; spire small, acute, consisting of four deeply divided, inflated volutions; aperture semilunated, a little longer than wide, internally provided with a white rib, with a rather large and deep umbilicus; whole surface covered with an epidermis, which rises into numerous, regular, somewhat longitudinally oblique foliations, or striæ, which rise into fine, flexible, hair-like, spinous processes. Length and diameter about the tenth of an inch.

This is rather a local species, inhabiting woods and shady places, under stones and leaves, &c. It has been found near Bulstrode, Buckinghamshire; Lackham, Wiltshire; Kingsbridge, Devonshire; Spetisbury, Dorsetshire; at Dovedale, Derbyshire; and the Dean, at Twizil, Northumberland; the Lomond Hills, Fifeshire; in the woods at Hopetoun, Linlithgowshire; and in

Ireland it is pretty generally diffused. It was met with plentifully at Portmarnock, County of Dublin, by my friend T. W. Warren, Esq., of Dublin; at Ben Bulben, County of Sligo, by William Thompson, Esq., of Belfast; and at Miltown Malbay, by W. H. Harvey, Esq.

18. *HELIX GRANULATA*, pl. VII, f. 23, 24.

Helix granulata, Alder, Mag. Zool. and Bot., II, p. 107; Forbes, Mal. Mon., p. 8; Thompson, Ann. and Mag. Nat. Hist., VI, p. 26; *Helix hispida*, Montagu, Test. Brit., p. 423; Maton and Rackett, Linn. Tr., VIII, p. 198; Fleming, Edin. Ency., VII, p. 79; Ib., Brit. An., p. 261; Brown, Ency. Brit., 6th Ed., VI, p. 458; Ib., Wernerian Mem., II, p. 225; Turton, Brit. Fau., p. 189; *Helix sericea*, Turton, Man., p. 38; Jeffreys, Linn. Tr., XVI, p. 333 and 507; *Helix globularis*, Jeffreys, Linn. Tr., XVI, p. 507; *Teba hispida*, Leach, Moll., p. 98; *Helix granulata*, Brown, Illust. Conch., p. 48, pl. 17, f. 8 and 13; Ib., First Ed., pl. 40, f. 8 and 13.

Shell subglobose, subpellucid, thin, fragile, and of a pale yellowish horn-colour; body ventricose, about a third longer than the spire, which consists of four rather tumid volutions, well defined by the sutural line, and terminating in a slightly obtuse apex; base well rounded, and provided with a very small umbilicus; aperture semilunar, its width exceeding its length; outer lip very thin, with a slight internal rib, apparent in the adult condition only; pillar lip slightly reflected, at the angle, over the umbilicus; whole surface covered with fine, close-set, short, downy, whitish hairs, which, when removed, exhibits the minutely granulated, shagreen-like, glossy exterior of the shell. Diameter a quarter of an inch.

This species is pretty generally spread over Great Britain. It is found in Wiltshire, Devonshire, Lincolnshire, Cornwall, Dorsetshire, and Northumberland; and is plentiful among nettles in the King's Park, at Edinburgh. In Ireland, I met with it at Naas, County of Kildare, and near Downpatrick; Mr. W. H. Harvey found it about Limerick and Ballitore; and Mr. Humphreys found it at Belgrove, east of Cork. Professor Forbes says it is common on the Isle of Man. Its habitat is in moist, woody situations.

19. *HELIX REVELATA*, pl. VII, f. 25, 26, 27.

Helix revelata, Féruccac, Prod., p. 44; Michel, Compl., p. 27, pl. 15, f. 6, 7, 8; Deshayes, Lam. An. Sans. Vert., VIII, p. 83; Brown, Illust. Conch., p. 48, pl. 17, f. 3, 4, 5; Ib., First Ed., pl. 40, f. 3, 4, 5.

Shell subglobose, thin, subpellucid, of a pale yellowish-green colour; body large; spire small, consisting of three moderately raised volutions, ending in a subobtuse apex; base not much raised, and provided with a narrow umbilicus; aperture sublunate, very oblique, and rather rounded; outer lip thin, and very slightly reflexed; pillar lip a little reflected over the umbilicus, and shewing only the base of the penultimate volution; surface covered with a few scattered grayish hairs, which, when removed, reveal a slightly wrinkled exterior. Diameter about a quarter of an inch.

Discovered by me on the Lomond Hills, Fifeshire, Scotland, and named *Vitrina membranacea* in the first edition of this work; it has since been met with by Professor Forbes in shady places, among nettles, near Dolyle's Monument, in Guernsey, where it is not uncommon.

20. *HELIX SERICEA*, pl. VII, f. 28, 29.

Helix sericea, Müller, Verm. Hist., II, p. 60, No. 258; Draparnaud, p. 103, pl. 7, f. 16, 17; Pfeiffer, I, p. 34, pl. 2, f. 17; Kenyon, Mag. Nat. Hist., I, p. 427, f. 3; Alder, Mag. Zool. and Bot., II, p. 107; Thompson, Ann. and Mag. Nat. Hist., VI, p. 26; Rossmassler, Icon., VII, p. 2, pl. 31, f. 428, 429; Brown, Illust. Conch., p. 48, pl. 18, f. 43, 44.

Shell subglobose, thin, diaphanous, subpellucid, and of a reddish horn-colour, with a nearly obsolete, spiral girdle surrounding the body volutions, producing a somewhat carinated aspect; body subdepressed, very tumid on the sides, considerably longer than the spire, which consists of four moderately rounded, gradually tapering volutions, terminating in a subobtuse apex; base not very prominent, with a rather small umbilicus; aperture sublunate, its length and width nearly equal; outer lip thin, destitute of an internal rib; pillar lip a little reflected over the umbilicus; whole shell covered with a brown epidermis, beset with remote, rather elongated, recurved, soft hairs, which, when removed, exposes a slightly wrinkled exterior. Diameter about a quarter of an inch.

Varieties are said to be found nearly white.

This species differs from *H. hispida*, in being thinner and more globular in form, and in the umbilicus being smaller. It will be known from the *H. granulata*, by being wrinkled, instead of having granulations.

Inhabits woody situations.

Mr. Alder, who first introduced this shell on the faith of Baron de Féruccac, gives no locality for it. Mr. Thompson gives it as an Irish specimen, from Lagan, near Belfast, but considers it as merely a variety of *H. hispida*.

21. *HELIX HISPIDA*, pl. VII, f. 30, 31.

Helix hispida, Müller, Verm., II, p. 73, No. 268; Draper-naud, p. 103, pl. 7, f. 20, 21, 22; Gmelin, Linn. Syst., I, p. 3625, No. 42; Pfeiffer, I, p. 36, pl. 2, f. 20; Brard, p. 27, pl. 2, f. 1; Turton, Man., p. 57, f. 41; Jeffreys, Linn. Tr., XIII, p. 338; Lamarck, An. San. Vert., VI, pt. 2nd, p. 92, No. 100; Rossmassler, VII, p. 2, pl. 31, f. 226, 227; Alder, Mag. Zool. and Bot., II, p. 107; Thompson, Ann. and Mag. Nat. Hist., VI, p. 27; Brown, Illust. Conch., p. 48, pl. 17, f. 40 and 46; Ib., First Ed., pl. 40, f. 40 and 46.

Shell subdepressed, subdiaphanous, of a brownish horn-colour, frequently of a dark reddish-brown; body large, convex on the sides, with a pale, central, transverse, subcarinated zone; spire small, subdepressed, consisting of three rather depressed and not deeply defined volutions, with a blunt apex; base not much produced, and with a deep, moderately-sized umbilicus; aperture moderate, subluniform, somewhat rounded; outer lip even, with an internal rib; pillar lip not reflected; whole exterior covered with fine, close-set, bristly hairs, which are very caducous, when these are removed the surface is slightly striated. Diameter a quarter of an inch; its length being hardly so much.

This species is always hairy, and very flat above, even in the youngest condition.

Not uncommon in many parts of Great Britain, and is widely spread over Ireland. It is found under stones, decayed trees, leaves, &c., both in dry and moist situations. Mr. Thompson mentions a well marked variety, which he found in the North of Ireland, where it is the most common form. It is larger,

more depressed, and with a more ample umbilicus, than the ordinary form.

22. *HELIX CONCINNA*, pl. VII, f. 32, 33.

Helix concinna, Jeffreys, Linn. Tr., XIII, p. 337; Alder, Mag. Zool. and Bot., II, p. 107; Thompson, Ann. and Mag. Nat. Hist., VI, p. 27; Forbes, Mal. Mon., p. 8; Brown, Illust. Conch., p. 48, pl. 18, f. 45, 46; *Helix depilata*, Alder, Mag. Zool. and Bot., II, p. 107; *Helix circinnata*, Féussac, Prod., No. 268.

Shell subdepressed, reddish-brown; body volution large, with a slight carina round its centre; spire small, abruptly tapering, consisting of four well defined, but depressed volutions, terminating in a subacute apex; aperture sublunate and roundish, its width somewhat more than its length; outer lip thin, even, with an internal rib; pillar lip with a slight reflection over the umbilicus, which is broad; exterior covered with rather remote, scattered, irregular, deciduous, whitish hairs, which are more plentiful near the suture of the spire, and around the umbilicus, beneath which it is concentrically grooved. Diameter upwards of three-eighths of an inch; length not quite so much.

This species is nearly allied to *H. hispida*, but somewhat larger, with a wider umbilicus, the hairs considerably more distant, and is generally more convex.

The *H. concinna* is widely spread all over England and Ireland. Its habitat is in dry situations, under stones and among nettles.

23. *HELIX DEPILATA*, pl. VII, f. 34, 35.

Helix depilata, Pfeiffer, I, p. 35, pl. 2, f. 18; Alder, Mag. Zool. and Bot., II, p. 107; Brown, Illust. Conch., p. 49, pl. 18, f. 47, 48.

Shell subglobose, depressed, concentrically grooved, and of a pale yellowish-brown; body very large; spire small, consisting of four volutions, terminating in a sharp point; base rather flat, provided with a pretty large umbilicus; aperture lunate; outer lip white, and thickened. Diameter not three-eighths of an inch; length a quarter of an inch.

This species is bald in all its stages from the young to the adult condition. It is somewhat like *H. concinna*, but is considerably smaller.

Inhabits moist situations, under hedges, &c.

Sub-Genus 5.—HELIOMANES.—Férussac.

Subglobose, umbilicated; peristome not reflected; epidermis thin; epiphragm membranaceous.

24. *HELIX VIRGATA*, pl. VIII, f. 1, 2, 3.

Helix virgata, Montagu, Test. Brit., p. 415, pl. 24, f. 1; Fleming, Edin. Ency., VII, p. 79; Ib., Brit. An., p. 261; Brown, Wernerian Mem., II, p. 524; Maton and Rackett, Linn. Tr., VIII, p. 195; Turton, Man., p. 40, f. 31; Thompson, Ann. and Mag. Nat. Hist., VI, p. 28; *Helix zonaria*, Pennant, Brit. Zool., IV, p. 137, pl. 85, f. 133; Donovan, Brit. Sh., pl. 65; *Helix variabilis*, Drapernaud, p. 84, pl. 5, f. 11, 12; Lamarek, An. San. Vert., VI, pt. 2nd, p. 83; Rossmassler, Icon., VI, p. 31, pl. 26, f. 356, *a to f*; Férussac, Journ. Phys., p. 297; Alder, Mag. Zool. and Bot., II, p. 109; *Helix striata*, Brard, p. 36, pl. 2, f. 5, 6; *Teba virgata*, Leach, Moll., p. 93; *Helix virgata*, Brown, Illust. Conch., p. 49, pl. 17, f. 42, 43, 44; Ib., First Ed., pl. 40, f. 42, 43, 44.

Shell subglobose, subpellucid; body large; spire small, consisting of five considerably inflated volutions, deeply defined by the sutural line; aperture sublunated, longer than wide, of a pale purplish-brown internally, inside with a narrow, white, thread-like elevation; outer lip thin, but not reflected; pillar lip slightly reflexed over the umbilicus; whole surface white, tinged with pale pink, usually with a dark purplish-brown zone round the centre of the body, continuing spirally at the base of the volutions of the spire, until it reaches the apex; base of the body generally with three or four concentric lines of the same dark colour; these in some instances are confluent, the intervening colourless parts appearing in spots; others are provided with two or three broader circular bands at the base, none of which, however, run close to the umbilicus, which is only of moderate size, but deep. Ordinary diameter three-eighths of an inch; but is frequently met with three-quarters of an inch.

This shell is subject to great variety in colour, and also in the number and disposition of its bands and markings; one of which is of a dark chocolate-brown, with a white central band round the body; sometimes it is pure white, and destitute of bands, while in other white specimens the zones are quite dis-

tinet and transparent; the apex for the most part is black. A beautiful variety is of a pale flesh-colour, with a white central band.

We met with a *lusus* of this species (pl. VIII, f. 4, 5) at Farbane, King's County, Ireland, with the volutions of the spire subscalariform, and the whole surface of a uniform reddish-brown colour, with a white band round the centre of the body, and continuing round the base of the volutions of the spire; and the apical volutions rather obtuse.

The *H. virgata* is a local species both in England and Ireland, but most plentiful where it occurs. It does not appear to extend further north than the central counties of England. In Ireland, I met with it plentifully in the King's County, Queen's County, and Kildare. At Ballinakill, I found some very large and beautiful specimens. My esteemed friend T. W. Warren, Esq., of Dublin, possesses the most beautiful and varied series of this shell, which any collection can boast of. The favourite habitat of this species is dry, sandy situations.

It has been remarked, that this shell never associates with the *H. erectorum*.

25. HELIX CAPERATA, pl. VIII, f. 6, 7.

Helix caperata, Montagu, Test. Brit., p. 430, pl. 11, f. 11; Turton, Brit. Fau., p. 188; Ib., Man., p. 42, f. 32; Maton and Rackett, Linn. Tr., VIII, p. 196; Brown, Wernerian Mem., II, p. 536; Fleming, Edin. Ency., VII, p. 80; Ib., Brit. An., p. 262; Jeffreys, Linn. Tr., XIII, p. 334; Forbes, Mal. Mon., p. 8; Thompson, Ann. and Mag. Nat. Hist., VI, p. 29; Brown, Illust. Conch., p. 49, pl. 17, f. 37 and 39; *Helix striata*, Draperaud, p. 106, pl. 6, f. 18 to 21; Lamarck, An. San. Vert., VI, pt. 2nd, p. 93; Rossmassler, V, p. 28, pl. 26, f. 354; *Helix intersecta*, Brard, p. 39, pl. 2, f. 7.

Shell subpellucid, subdepressed; spire with five flattened volutions, and terminating in a somewhat obtuse, nearly black apex; body provided with a subcarinated belt round its centre, the base with a large and deep umbilicus; aperture semilunar; outer and inner lips thin, the latter not reflected over the umbilicus; generally of an ash-colour, or yellowish, and entirely covered with strong, regular, close-set, longitudinal striæ; superior portion of the body usually provided with a brown spiral band, which is continuous on the base of the volutions of the

spire; base generally with several concentric, dark brown bands, which are interrupted at intervals, producing a catinated, or spotted appearance; sometimes the fasciæ are confluent, and spotted with white. Diameter at the base generally about three-eighths of an inch; height about a quarter.

This species is liable to considerable variation in colour and markings, and even in size. Some are of a brownish ash-colour, gray, or cream-colour; others are dark brown, with a white, subcarinate band round the body; but most of them have a faint indication of spiral bands. Colonel Montagu observes, that "in shape it is a medium between *Helix virgata* and *radiata*; it is not so produced as the former, nor so flat as the latter; in the bands, or fasciæ, at the base it somewhat resembles the first, and in being strongly striated is like the last."

This is a local species, and has been found in Wiltshire, South Devonshire, Cornwall, and Cumberland. It is plentiful in the neighbourhood of the Old Quarry, back of and also at the base of the cliffs in front of Salisbury Crags, at Edinburgh. I found it plentifully on mud walls at Naas, County of Kildare. Thompson says, it seems to prevail only in the "southern half of the island, and is plentiful where it does occur." He particularises Glanmire, near Cork, by W. H. Harvey, Esq.; Kilkee Castle, near Ballitore, County of Kildare, La Bergerie, Queen's County, by Mr. Patterson, of Belfast; and at Kingstown, near Dublin, by T. W. Warren, Esq.

26. *HELIX PISANA*, pl. VIII, f. 8, 9, 10, 11, 12, 13.

Helix pisana, Müller, Verm., II, p. 60, No. 255; Lamarck, An. San. Vert., pt. 2nd, p. 82; Rossmassler, V, VI, p. 34, pl. 26, f. 259, a, b, c, d; Brown, Ency. Brit., 6th Ed., VI, p. 459; Fleming, Brit. An., p. 259; Alder, Mag. Zool. and Bot., II, p. 109; Thompson, Ann. and Mag. Nat. Hist., VI, p. 28; *Helix cingenda*, Montagu, Test. Brit., p. 418, pl. 24, f. 4; Maton and Rackett, Linn. Tr., VIII, p. 195, pl. 5, f. 6; Turton, Brit. Fau., p. 188; Ib., Man., p. 39, f. 30; Jeffreys, Linn. Tr., XIII, p. 333; Fleming, Edin. Ency., VII, p. 79; Phillippi, Enum. Moll. Sic., p. 131, No. 22; *Helix albana*, Müller, Verm., II, p. 25, No. 226; *Helix zonaria*, Pennant, Brit. Zool., IV, p. 137, pl. 85, f. 133; *Helix rhodostoma*, Drapernaud, p. 86, pl. 5, f. 13, 14, 15; *Teba cingenda*, Leach, Moll., p. 92; *Helix pisana*,

Brown, Illust. Conch., p. 50, pl. 17, f. 27, 29, 33, 35, 38, and 58; Ib., First Ed., pl. 40, f. 27, 29, 33, 35, 38, and 58.

Shell subpellucid, subglobose; body large; spire small, consisting of four volutions, the three superior ones but little elevated above the others, and terminating in an obtuse, depressed apex; body volution somewhat angulated, or flattened above; base well rounded, with a narrow and deep umbilicus; aperture semilunar, somewhat longer than wide; outer lip thin, as well as the pillar lip, which is abruptly reflected half over the umbilicus; whole surface of a cream-white, or yellowish, with several spiral bands of chestnut, or purplish-brown; sometimes these are interrupted, forming short, longitudinal, streaks or dots; base generally provided with one broad concentric band, at a little distance from the umbilicus, but with two in some specimens; near the aperture the colour is more or less roseate; apex defined by a black spiral line. Diameter generally three-quarters of an inch; length half an inch. But is subject to a considerable difference in size.

Fig. 14, 15, the young shell.

A variety of this species is met with quite plain, and in some specimens with only a few faint zones on the body.

This species bears a considerable similitude to *H. virgata*, but it is larger and broader, with a more depressed apex.

This is one of the rarest, and most beautiful of our land shells; Montagu found it on the south of Tenby, close to the sea shore, and also on the west of that place. The Rev. Thos. Rackett found it at St. Ives, Cornwall, and was first discovered in Ireland, near Balbriggan, on the County of Meath side of the stream that divides that county from Dublin, by my friend M. J. O'Kelly, Esq., of Rochestown House, County of Dublin; Thos. Wm. Warren, Esq., of Dublin, afterwards found it in the same locality. Mr. Humphreys detected it on the north side of the river Boyne, near Drogheda.

27. *HELIX ERICITORUM*, pl. VIII, f. 16, 17, 18, 19.

Helix ericitorum, Müller, Verm., II, p. 233, No. 236; Lamarck, An. San. Vert., VI, pt. 2nd, p. 84; Montagu, Test. Brit., p. 436; Fleming, Edin. Ency., VII, p. 80; Ib., Brit. An., p. 260; Brown, Ency. Brit., 6th Ed., p. 459; Ib., Wernerian Mem., II, p. 524; Donovan, Brit. Sh., pl. 151, f. 2; Maton and Rackett, Linn. Tr. VIII, p. 194; Alder, Mag. Zool. and Bot.,

II, p. 109; Rossmassler, I, p. 67, pl. 1, f. 17; Forbes, Mal. Mon., p. 8; Thompson, Ann. and Mag. Nat. Hist., VI, p. 30; Turton, Brit. Fau., p. 188; Ib., Man., p. 54, f. 37; Brard, p. 45, pl. 2, f. 8; Brown, Illust. Conch., p. 50, pl. 17, f. 21, 23, and 34; Ib., First Ed., pl. 40, f. 21, 23, and 34; *Helix cespitum*, Drapernaud, p. 109, pl. 6, f. 16; Pfeiffer, I, p. 39, pl. 2, f. 24, 25; *Helix erica*, Da Costa, Brit. Couch., p. 53, pl. 54, f. 8; *Helix albella*, Pennant, Brit. Zool., IV, p. 132, pl. 85, f. 122; *Zonites ericitorum*, Leach, Moll., p. 163.

Shell depressed, and subpellucid; body very large; spire very short, consisting of five much depressed volutions, but little elevated above the body, which is remarkably inflated; base furnished with a very large and deep umbilicus, which exposes, internally, nearly half of the breadth of the volutions of the spire; aperture rather longer than wide, sublunated, or nearly circular; outer lip thin, reflected, nearly uniting all round, except where it is interrupted by the body on the columella; whole surface covered with longitudinal, slightly concentric wrinkles; colour yellowish-white, or grayish-brown; the superior portion of the body generally furnished with a brown band on its upper part, which is continuous at the base of the volutions of the spire, and defining their division; base of the body well rounded, and usually with one nearly central, concentric, broad, dark brown band, and several narrower paler ones on each side, varying from one to five in number. Diameter three-quarters of an inch, and sometimes more; height a little more than a quarter.

This species is subject to considerable variations in its colouration; sometimes quite white, which was considered by Hartmann as a distinct species, and described under the name of *H. obliterata*; sometimes the bands are continuous, and at others interrupted in a catinated manner. It is also liable to vary in size; in some instances little more than half the dimensions of our figures. Mr. Jeffreys, in the Linnæan Transactions, XIII, p. 339, describes a variety found in Iona, one of the Western Islands of Scotland, which has a more produced spire than the ordinary form.

Helix elegans, Brown, Wernerian Mem., II, p. 528, pl. 24, f. 9; *Carocolla elegans*, Brown, 1st Ed., pl. 40, f. 28; *Helix*

disjuncta, Turton, Conch. Dict., p. 61, f. 63; *Helix ericitorum*, Brown, Illust. Conch., p. 50, pl. 17, f. 28.

This remarkable *lusus*, pl. VIII, f. 19, was found near Golden Bridge, Dublin, by Mr. Edward Stephens, and is in the cabinet of my old and respected friend M. J. O'Kelly, Esq., of Rochestown House, County of Dublin, where I again saw it in August, 1841.

The *H. ericitorum* is a widely diffused species throughout the South of England and the Isle of Man, and appears to abound all over Ireland and its adjacent islands. A favourite resort seems to be the marine sand banks around the coast, and is also common in many inland situations. Mr. Thompson mentions having found a specimen nine lines in circumference at Portarlington, where I likewise met with large and beautiful specimens. Thompson also adds, "As an exception to the more ordinary places of its occurrence, may be mentioned the ruins of Dunluce Castle, situated on the summit of an insulated mass of rocks, considerably elevated above the sea."

Sub-Genus 6.—VERTICILLATÆ.—Férussac.

Shells striated, and varied in colour.

28. *HELIX ROTUNDATA*, pl. VIII, f. 20, 21, 22, 23, 24.

Helix rotundata, Müller, Verm., II, p. 29, No. 231; Draperaud, p. 114, pl. 8, f. 4; Brard, p. 51, pl. 2, f. 10, 11; Pfeiffer, I, p. 44, pl. 2, f. 33, 34; Rossmassler, VII, p. 13, pl. 32, f. 454; Fleming, Brit. An., p. 263; Alder, Mag. Zool. and Bot., II, p. 109; Jeffreys, Linn. Tr., XIII, p. 342; Forbes, Mal. Mon., p. 8; Thompson, Ann. and Mag. Nat. Hist., VI, p. 30; *Helix radiata*, Montagu, Test. Brit., p. 432, pl. 24, f. 3; Da Costa, Brit. Conch., p. 57, pl. 4, f. 15, 16; Brown, Wernerian Mem., II, p. 525; Fleming, Edin. Ency., VII, p. 80; Maton and Rackett, Linn. Tr., VIII, p. 199; Turton, Man., p. 59; *Zonites radiatus*, Leach, Moll., p. 102; *Helix rotundata*, Brown, Illust. Conch., p. 51, pl. 17, f. 14, 18, 19, 20, and 24; Ib., First Ed., pl. 40, f. 14, 18, 19, 20, and 24.

Variety 1. Spire depressed.

Helix Turtoni, Fleming, Brit. An., p. 260; *Helix albella*, Nilsson, p. 30.

Variety 2, pl. XVII, f. 14 and 20. *Pale, nearly colourless, semitransparent, and destitute of rays.*

Shell with the spire depressed, consisting of five rather flattened, but well defined volutions; body rounded, with a subcarinated zone round its centre; base convex, with a very large and deep umbilicus, exhibiting all the superior volutions internally; aperture semilunar; outer lip thin, and not reflected; whole surface of a light brown colour, and diagonally rayed with chestnut; and with strong, longitudinally oblique, regular, close-set striæ. Diameter a little more than a quarter of an inch.

This shell is found all over Great Britain and Ireland, on old walls, dry mud banks, and under stones in woody situations.

Mr. Thompson mentions having found a specimen at Shane's Castle Park, County of Antrim, whose height and diameter were equal, and procured two of the crystalline variety at Holywood House, County of Down.

39. *HELIX PYGMÆA*, pl. VIII, f. 25, 26.

Helix pygmæa, Drapernaud, p. 114, pl. 8, f. 8, 9, 10, No. 51; Féüssac, Prod., No. 200; Gray, Med. Rep., 1821, p. 239; Turton, Man., p. 61, f. 46, No. 46; Pfeiffer, III, p. 21, pl. 4, f. 20, 21; Nilsson, Sacc., p. 32; Jeffreys, Linn. Tr., XVI, p. 343; Rossmassler, VIII, p. 37, pl. 39, f. 532; Alder, Mag Zool. and Bot., II, p. 109; Thompson, Ann. and Mag. Nat. Hist., VI, p. 31; Brown, Illust. Conch., p. 51, pl. 18, f. 48, 49; *Helix Kirbii*, Sheppard, Linn. Trans, XVI, p. 162; Jeffreys, Linn. Tr., XIII, p. 512.

Shell subdiaphanous, with the body large; spire very small, consisting of three rapidly, well defined, diminishing volutions, terminating in a subobtuse apex; aperture roundish, subluniform, width and length equal; outer lip thin, but not reflected; of a horn-colour, with very slight longitudinal striæ; umbilicus rather large; base rounded. Diameter about the fifteenth of an inch.

A local species in Britain, inhabiting shaded and moist localities, lurking under stones and fallen leaves, and has been met with near Clare, in Suffolk; at Devizes, Wiltshire; and near Wylam and at Twizil House, Northumberland. We found it in Rosslyn Glen, County of Mid Lothian, and Thompson says

it locates at Ballantrae, Ayrshire. Mr. Thompson informs us that it is "indigenous to the more northern two-thirds of Ireland, from east to west." He particularises the Counties of Down, Antrim, Clare, and Queen's County.

It differs from the following species, in being more depressed and transparent.

30. *HELIX UMBILICATA*, pl. VIII, f. 27, 28.

Helix umbilicata, Montagu, Test. Brit., p. 434, pl. 13, f. 2; Maton and Rackett, Linn. Tr., VIII, p. 20; Fleming, Brit. An., p. 262; Ib., Ency. Brit., VII, p. 80; Brown, Ency. Brit., 6th Ed., VI, p. 458; Ib., Wernerian Mem., II, p. 525; Turton, Brit. Fau., p. 189; Thompson, Ann. and Mag. Nat. Hist., VI, p. 31; *Helix rupestris*, Drapernaud, p. 82, pl. 8, f. 7, 8, 9; Féruccac, Prod., No. 201, pl. 80, f. 2, 3; Pfeiffer, III, p. 22, pl. 4, f. 22; Turton, Man., p. 60, f. 45; Forbes, Mal. Mon., p. 8; Alder, Mag. Zool. and Bot., II, p. 109, No. 30; *Zonites rupestris*, Leach, Moll., p. 103; *Helix umbilicata*, Brown, Illust. Conch., p. 51, pl. 17, f. 30, 31; Ib., First Ed., pl. 40, f. 30, 31.

Shell subpellucid, of a dark burnt umber-brown colour; body large; spire of medium length, consisting of four much inflated volutions, deeply divided by the sutural line, and terminating in a moderately produced apex; whole shell covered by very fine, longitudinal striae; aperture nearly circular; outer lip thin, and not reflected; base rounded and inflated, with a very large and deep umbilicus, exposing the inside of the volutions of the spire. Diameter at the base one-tenth of an inch; height not quite so much.

This shell has much the aspect of the preceding, but will be readily recognised by its superior size, being a third larger than that of the latter. It is rather local in Britain. It frequents high rocky situations, lurking in crevices, of dry and old walls, and under stones. Montagu says, "it is remarkable that this shell always affects such lofty places as the tops of houses, without one being found near the base; and in that situation its inhabitant braves equally the scorching beams of the sun in summer, and the frigid winds of winter, without attempting to descend." Thompson remarks that it is generally distributed throughout the southern three-fourths of Ireland, more parti-

cularly over the great limestone belt which traverses the country. I met with it first in Ireland, in the crevices of a mossy stone, at Clonooney Barracks, King's County. Forbes gives its habitat on walls, near Douglas, Isle of Man.

Sub-Genus 7.—HYALINÆ.—Férussac.

Shell diaphanous, glabrous, hyaline, and shining.

31. *HELIX CELLARIA*, pl. IX, f. 1, 2.

Helix cellaria, Müller, Verm., II, p. 28, No. 280; Lamarck, An. San. Vert., VI, pt. 2nd, p. 91, No. 96; Pfeiffer, I, p. 42, pl. 2, f. 29, 30; Rossmassler, I, p. 70, pl. 1, f. 22; Ib., VII, p. 36, pl. 39, f. 527; Alder, Mag. Zool. and Bot., II, p. 108, No. 22; Forbes, Mal. Mon., p. 10; Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; *Helix nitida*, Drapernaud, p. 117, pl. 3, f. 23, 24, 25; Brard, p. 34, pl. 2, f. 3, 4; Brown, Ency. Brit., 6th Ed., VI, p. 458; *Helix nitens*, Maton and Rackett, Linn. Tr., VIII, p. 198, pl. 5, f. 7; Brown, Wernerian Mem., II, p. 525; *Helix lucida*, Montagu, Test. Brit., p. 425, pl. 23, f. 4; Turton, Man., p. 56, pl. 4, f. 40; *Zonites lucida*, Leach, Moll., p. 10; *Helix cellaria*, Brown, Illust. Conch., p. 51, pl. 17, f. 59, 60; Ib., First Ed., pl. 40, f. 59, 60.

Shell thin, smooth, glossy, and pellucid, of a yellowish-green horn-colour; body very wide, but short; spire small, much depressed, and very little elevated above the body, consisting of four volutions, not deeply divided, but well defined by the sutural line, terminating in a blunted apex; base not much rounded, furnished with a moderately large and very deep umbilicus, and of a paler colour than the superior portion; aperture luniform, compressed, oblique, its length and width equal; outer lip thin, and not at all reflected. Varying in diameter from half an inch to three-quarters.

This species is almost universally diffused throughout Great Britain and Ireland. Its habitat is variable, sometimes being found in cellars,—hence its name,—and at other times lurking under stones on the sides of roads, or in meadows and fields, and always in damp situations. T. W. Warren, Esq., of Dublin, possesses some very large specimens, measuring seven lines and a half in diameter, which he found in drains within the City of Dublin.

32. *HELIX ALLIARIA*, pl. IX, f. 3, 4.

Helix alliaria, Miller, Ann. Phil., N. S., VII, p. 379; Turton, Man., p. 56, f. 39; Alder, Mag. Zool. and Bot., II, p. 108; Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; Brown, Illust. Conch., p. 52, pl. 17, f. 48 and 52; Ib., First Ed., pl. 40, f. 48 and 52; *Helix nitens*, Sheppard, Linn. Trans., XVI, p. 160; *Helix faeteda*, Stark, Elem. Nat. Hist., II, p. 59; *Helix alliacea*, Jeffreys, Linn. Tr., XIII, p. 341 and 511.

Variety 1. Larger.

Helix glabra, Studer; Féruccac, Prod., No. 215; Alder, Mag. Zool. and Bot., II, p. 108; Rossmassler, VIII, p. 36, pl. 39, f. 528.

Variety 2. Greenish-white, and very transparent.

Shell almost smooth, thin, very glossy, transparent, yellowish or a greenish horn-colour; body large, slightly produced on the sides; spire small, consisting of three nearly depressed, but deeply divided volutions; base a little rounded, and whitish; aperture sublunate and suboblique, clasping about two-thirds of the body; whole surface covered with nearly obsolete, longitudinal wrinkles, which are only visible by the aid of a strong lens; umbilicus large and deep. Diameter a quarter of an inch; height about half its circumference.

This species has much the aspect of *H. cellaria*, but is only about a third of the size; it is much more glossy and transparent than either the *H. cellaria* or *nitidula*, the aperture is less oblique than either, and the umbilicus larger. When alive, it has a fetid smell, somewhat resembling garlic.

Its habitat is in woods and shaded places, under decayed leaves, &c.; and on wet banks, among mosses and jungermanniae.

This species is met with in all parts of Britain; and is plentiful near Lancaster, the neighbourhood of Durham, and Gisborne Park, Yorkshire; near Edinburgh, and in Fifeshire, Scotland. Jeffreys says he found it so far north as Lerwick, in Shetland, near the sea shore under stones. Mr. Thompson says that it occurs in Ireland, from the exposed sea shore to the mountain side, and in shaded situations in woods. The green variety is the most common in Ireland, as well as in Scotland.

33. *HELIX NITIDULA*, pl. IX, f. 5, 6.

Helix nitidula, Drapernaud, p. 117, pl. 8, f. 21, 22; Gray,

Med. Rep., 1821, p. 239; Sheppard, Linn. Trans., XIV, p. 160; Jeffreys, Linn. Tr., XIII, p. 340; Alder, Cat., p. 134, f. 49; Ib., Mag. Zool. and Bot., II, p. 107; Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; Brown, Illust. Conch., p. 52, pl. 18,* f. 1, 2.

Variety 1. *Helix Helmii*, Gilbertson, MSS.; Alder, Local. Cat., p. 107.

Shell subpellucid; consisting of four and a half volutions, the whole much depressed, those of the spire but little raised, and defined by a very slender line, the body one rounded at the sides; apex obtuse; base a little concave, with a large and deep umbilicus, exposing the lower volutions of the spire internally; aperture semilunar; whole surface with rather strong, longitudinal wrinkles; of a dull yellowish-brown above, the base more glabrous, except close around the umbilicus, where it is opaque and whitish. Diameter about three-tenths of an inch.

It differs from *H. cellaria* in being a little more convex above, and somewhat more concave below. Its dull aspect above is also a well marked character. The opaque white below is not so much spread as in the former species.

Found under stones, at the sides of hedges, in England, where it is rather local, and in Ireland, where it is generally diffused, Mr. Thompson gives its habitat "among mosses, in glens and sheltered places;" and adds, "from two localities in this country (Ireland), I have seen Helices of crystalline transparency, and in form intermediate between *H. nitidula* and *H. alliaria*."

34. *HELIX LUCIDA*, pl. IX, f. 7, 8.

Helix lucida, Drapernaud, p. 103, pl. 8, f. 11, 12; Pfeiffer, I, p. 35, pl. 2, f. 18; Von Alten, S. 72, pl. 8, f. 15; Thompson, Ann. and Mag. Nat. Hist., VI, p. 33; Alder, Mag. Zool. and Bot., II, p. 107; Turton, Man., p. 56, pl. 5, f. 38; Brard, p. 34, pl. 2, f. 3, 4; Brown, Illust. Conch., p. 52, pl. 18,* f. 3, 4; *Helix nitida*, Gray, Med. Rep., 1821, p. 239.

Shell dark chocolate-colour when the inhabitant is alive, and of a dark horn-colour when extracted, subdepressed; spire slightly elevated, consisting of four volutions, finely striated longitudinally; base a little produced, with a large umbilicus, in which the second volution is visible; aperture subrotund. Diameter about a quarter of an inch.

This species may be confounded with its congeners, but will be distinguished from *H. nitidula*, *cellaria*, and *alliaria*, by its greater convexity, its more regular striæ, darker colour, and in being devoid of the opaque whitish aspect of its base.

This is a rare and local species. It has been met with near Wolverhampton; Tenby, Wales; in the neighbourhood of Shrewsbury, and near Newcastle-upon-Tyne. Mr. Thompson remarks that it appears to be rare in Ireland, as well as in England. He gives as localities, in the rejectamenta of the rivers Lagan and Blackwater, near Belfast; also near Portarlington and Finnoe, north of Tipperary.

35. *HELIX RADIATULA*, pl. IX, f. 9, 10.

Helix radiatula, Alder, Cat., p. 12, No. 50; Ib., Mag. Zool. and Bot., II, p. 107; Jeffreys, Linn. Tr., XIII, p. 511; Thompson, Ann. and Mag. Nat. Hist., VI, p. 33; Brown, Illust. Conch., p. 53, pl. 18,* f. 5, 6; *Helix striatula*, Gray, Med. Rep., 1821, p. 239; *Helix brevipes*, Turton, Man., p. 65, pl. 5, f. 50.

Shell pellucid, diaphanous, horn-coloured, depressed; spire but little elevated above the body volution, and consisting of three volutions, which are particularly flat at their junction; body large, in proportion to the spire; upper parts covered with regular, continuous, longitudinal striæ, and producing a radiated appearance; base smooth, with a moderately sized umbilicus. This is an exceedingly minute species, its diameter hardly exceeding the twentieth of an inch.

Its habitat is in wet mossy ditches, and in damp wooded localities.

Distinguished from the young of *H. zonites*, by the great flatness of the volutions at their lower side, and by the striæ being more regular and decided.

This shell occurs in many parts of Britain. Mr. Thompson gives as localities, Dovedale, Derbyshire; the Falls of Clyde, Lanarkshire; and Ballantrae, Ayrshire; and in Ireland, he says it is widely distributed, namely, Londonderry, near Dublin, Downshire, Antrim, Tyrone, Cork, and Queen's County.

36. *HELIX CRYSTALLINA*, pl. IX, f. 11, 12.

Helix crystallina, Müller, Verm., II, p. 23, No. 223; Pfeiffer, I, p. 46, pl. 2, f. 36; Drapernaud, p. 118, pl. 8, f. 13 to 28; Gray, Med. Rep., 1821, p. 239; Alder, Mag. Zool. and Bot., II, p. 108; Turton, Man., p. 58, f. 42; Jeffreys, Linn. Tr.,

XIII, p. 341 and 511; Thompson, Ann. and Mag. Nat. Hist., VI, p. 34; Rossmassler, VIII, p. 37, pl. 39, f. 531, var.; Brown, Illust. Conch., p. 53, pl. 18,* f. 7, 8; *Helix vitrea*, Brown, Edin. Journ. Nat. and Geo. Science, I, p. 12, pl. 1, f. 12, 13, 14; *Zonites crystallinus*, Leach, Moll., p. 105.

Shell thin, depressed, of a very glossy, crystalline, greenish-white colour; spire with five well defined, gradually decreasing volutions, terminating in an extremely small, hardly-raised apex; base of the shell a little convex, provided with a small, but deep umbilicus; aperture semi-lunate, and enveloping the body. Diameter three-sixteenths of an inch.

This species may at once be distinguished from its congeners, by its extremely glass-like aspect, the number of its volutions, and in the body one being but little thicker than the lower volution of the spire.

The *H. crystallina* is not uncommon in many parts of England. It was first found in Scotland by my esteemed friend James Gerard, Esq., who detected it in an old wall at Corstorphine Hill, near Edinburgh; where I afterwards found it. Thompson says it is generally distributed in Ireland, occurring in moss, under stones, and upon decaying wood, both in wet and dry situations. He adds, "Some adult specimens which I have collected have had but three and a half volutions, instead of four and a half or five, the ordinary number." I have great doubts of these last mentioned being really the *H. crystallina*, as one of its strongest characters is, the number of its volutions, in which it is only equalled by the following species.

37. *HELIX EXCAVATA*, pl. IX, f. 13, 14.

Helix excavata, Bean; Alder, Cat., p. 13, No. 53; Ib., Mag. Zool. and Bot., II, p. 107; Thompson, Ann. and Mag. Nat. Hist., VI, p. 34; Brown, Illust. Conch., p. 53, pl. 18,* f. 9, 10; *Helix lucida*, var., Turton, Man., p. 57, pl. 4, f. 39; *Helix nitida*, Jeffreys, Linn. Tr., XIII, p. 339 and 511.

Shell subglobose, transparent, diaphanous, shining, yellowish horn-coloured, and covered with longitudinal, irregular wrinkles; body very large; spire subdepressed, small, consisting of four or five well rounded, close-set volutions, terminating in an obtuse apex; base considerably inflated, and provided with a large and deep umbilicus, in which may be seen the inside of

the volutions, nearly to the apical one; aperture slightly lunate, or nearly round. Diameter about a quarter of an inch.

Discovered near Scarborough by Mr. Bean, and has been found by Mr. Alder in Northumberland; and Thompson says he has seen but one Irish specimen, which was procured at Dunscombe Wood, near Cork, by Miss King, of Cork.

Its favourite habitat is timber which has been cut down, and under decayed wood.

38. *HELIX PURA*, pl. IX, f. 15, 16.

Helix pura, Alder, Cat., No. 46; Ib., Mag. Zool. and Bot., II, p. 108; Thompson, Ann. and Mag. Nat. Hist., VI, p. 32; Turton, Man., p. 59, the description only; Brown, Illust. Conch., p. 53, pl. 18,* f. 11, 12; *Helix nitidula*, var. β , Jeffreys, Linn. Tr., XIII, p. 511.

Variety 1. Shell pale horn-coloured. Alder, Mag. Zool. and Bot., II, p. 108.

Shell nearly white, depressed, somewhat pellucid, and glossy, a little striated, or wrinkled; body large; spire small, with three volutions, placed somewhat oblique; base considerably flattened, provided with a large and deep umbilicus; base never opaque. Diameter between a fifth and sixth of an inch.

This shell differs from *H. crystallina* in being larger, more convex, and less glossy; the volutions are not so closely set, the body somewhat larger in proportion to the spire, with a larger umbilicus, and especially in the fine, regular striae, of which the *H. crystallina* is destitute.

Found near Newcastle-upon-Tyne by Joshua Alder, Esq., and as far as is known, rather a local species in England; in Ireland, according to Thompson, it is rather widely spread; its usual habitat being among moss, in sheltered situations. I found it near Cabinteely, County of Dublin. The yellowish horn-coloured variety is most commonly met with.

Sub-Genus 8.—TRIGONOSTOMA.—Férussac.

Shell subdiscoidal; apex depressed; base umbilicated; aperture trigonal; outer lip denticulated; epidermis for the most part hispid.

39. *HELIX OBVOLUTA*, pl. IX, f. 16, 17.

Helix obvoluta, Müller, Verm., II, p. 24; *Helix helosericea*, Drapernaud, p. 112, pl. 7, f. 27 and 29; Brard, p. 62, pl. 2, f. 16, 17; Pfeiffer, I, p. 41, pl. 2, f. 28; Rossmassler, I, p. 70, pl. 1, f. 21; Féruccae, Prod., p. 38, No. 107; Lindsay, Linn. Trans., XVI, p. 765; *Helix obvoluta*, Brown, Illust. Conch., p. 53, pl. 18,* f. 13, 14.

Shell reddish-brown, planorbiform, depressed both above and below, and largely umbilicated; spire concave, and consisting of five narrow volutions; aperture triangular; the outer lip reflexed, pale red, and provided internally with a small, blunted tooth. Diameter five-eighths of an inch.

Discovered by Dr. James Lindsay in Ditcham Wood, near Brenton, Hampshire, where he collected about twenty specimens. Its habitat is among moss at the roots of trees. As this shell is a well known continental species, and having been found in one locality only, it is probable that it has been introduced among plants.

40. *HELIX MARGARITACEA*, pl. IX, f. 18, 19, 20.

Helix margaritacea, Brown, Illust. Conch., p. 54, pl. 17, f. 54, 55, 56; *Vitrina margaritacea*, Brown, First Ed., pl. 40, f. 54, 55, 56.

Shell depressed both above and below, very thin and hyaline; spire hardly elevated above the body, and consisting of three pretty well rounded and rapidly decreasing volutions; sides of the body inflated, and rather thick in proportion to its size; base rounded, and provided with a small and shallow umbilicus; aperture suborbicular, with a very thin outer lip; whole surface of a pearly white, exhibiting iridescent reflections. Diameter an eighth of an inch.

Discovered by James Gerard, Esq., on an old wall at Corstorphine Hill, near Edinburgh.

ORDER GASTEROPODA.

Animals with straight bodies, never spiral, nor totally enveloped in their shell; the foot, or disc, situated under the belly, united to the body nearly its whole length, and serving as an organ of locomotion.

DIVISION I.—PNEUMOBRANCHIÆ.

Branchiæ in the form of a vascular net, or the wall of a particular cavity, opening by a hole which the animal contracts or dilates at pleasure. The animals respire air.

FAMILY I.—LIMACINEA.

Animals almost wholly naked, with elongated bodies, creeping by means of a ventral disc, with a narrow mantle bordering their sides.

GENUS I.—VITRINA.—Drapernaud.

Shell oblong, thin, transparent, fragile, and glassy; spire short, depressed, with seldom more than three, rapidly increasing volutions; body large; aperture very ample, its width being generally greater than its length, and somewhat oblong; margin of the outer lip thin; columellar side deeply emarginate by the body; columella merely a simple spiral line.

1. VITRINA PELLUCIDA, pl. IX, f. 21, 22, 23.

Vitrina pellucida, Drapernaud, p. 119, pl. 8, f. 34 to 37; Lamarck, An. San. Vert., VI, pt. 2nd, p. 53; Fleming, Brit. An., p. 267; Ib., Phil. Zool., II, p. 459, pl. 4, f. 1; Turton, Man., p. 31, f. 21; Alder, Mag. Zool. and Bot., II, p. 105; Forbes, Mal. Mon., p. 7; Thompson, Ann. and Mag. Nat. Hist., VI, p. 19; *Vitrina Dillwynii*, *depressa*, and *diaphana*, Jeffreys, Linn. Tr., XVI, p. 326; *Vitrina Mülleri*, Jeffreys, Linn. Tr., XV, p. 326; *Vitrina Drapernaudii*, Leach, Moll., p. 80; Jeffreys, Linn. Tr., XVI, p. 326; *Vitrina beryllina*, Pfeiffer, p. 47, pl. 3, f. 1; *Vitrina elongata*, Turton, Man., p. 31, f. 22; *Helix pellucida*, Müller, Verm., II, p. 16; Pennant, Brit. Zool., IV, p. 138, No. 134; *Helix elliptica*, Brown, Wernerian Mem., II, p. 525, pl. 24, f. 8; *Helicolimax pellucidus*, Féruccac, Hist. Moll., pl. 9, f. 6; *Vitrina pellucida*, Brown, Illust. Conch., p. 54, pl. 17, f. 6, 7, and 12; Ib., First Ed., pl. 40, f. 6, 7, and 12.

Shell elliptical, subdepressed, very thin, of a pale yellowish-green colour, hyaline, and extremely glossy; body very large, oblique; spire very small, and consisting of two volutions, which rise but little above the body, and terminate in an obtuse

apex, well defined by a striated sutural line, discoverable only by the aid of a lens; aperture oval, and very large, interrupted above by the superior portion of the body; outer lip thin, frequently with a pale brown margin; pillar lip slightly reflected, and a little concave above.

Subject to some variety both in form and colour; but all I have seen are only entitled to rank as one species.

This species is found in all localities; for I have met with it in very moist situations, among decayed leaves, under stones, &c., and I have procured specimens near the summit of Arthur's Seat, at Edinburgh, eight hundred feet above the level of the sea. It prevails all over Ireland, and Thompson has found it in high mountain localities.

I first observed this species in the cabinet of Mr. Dixon, of Bishopwearmouth, in 1810, and drew and described it under the name of *Helix virides*, as it was the green variety. I afterwards met with the pale yellowish-white variety, in 1814, at Farbane, King's County, Ireland.

GENUS II.—TESTACELLA.—Cuvier.

Shell very small, compressed, placed externally on the animal, auriform; apex obsoletely spiral, consisting of less than two volutions; aperture very large, wide, and oblique; columella flat; outer lip reflected and thin, with a slight sinus behind.

This singular univalve is found attached to the back of the animal, near its posterior extremity.

1. TESTACELLA HALIOTOIDEA, pl. IX, f. 24, 25.

Testacella Haliotoidea, Drapernaud, p. 121, pl. 8, f. 44, 45; Lamarck, An. San. Vert., VI, pt. 2nd, p. 52; Cuvier, An. du Mus., V, p. 440, pl. 29, f. 6, 7; Thompson, Ann. and Mag. Nat. Hist., VI, p. 19; *Testacella scutulum*, Sowerby, Gen. Rec. and Foss. Sh., f. 3, 3; *Testacellus Haliotoideus*, Féruccac, Hist., pl. 8, f. 5 to 9; Sowerby, Gen., f. 1, 2; Alder, Mag. Zool. and Bot., II, p. 105; *Testacella Europaea*, Roissy. Buffon, V, p. 252; *Testacella Haliotoidea*, Brown, Illust. Conch., p. 54, pl. 18,* f. 15, 16.

Variety 1. *Testacella scutulum*, Sowerby.

Shell auriform, ovoid, or elongated; vertex rather large, acute, placed at one extremity, and pointing to one side; aper-

ture very large; pillar lip, near its upper extremity, broad, flat, and very slightly reflected at the edge; outer lip dilated.

Inhabits gardens, at Lambeth, and other localities near London. It was found many years ago at Youghal, Ireland, by Robert Ball, Esq., of Dublin. The Irish specimens agree with the *T. scutulum* of Sowerby. Mr. Thompson says it has also been found in a garden at Bandon, by Mr. G. S. Allman. I concur with Mr. Ball and Mr. Thompson, in considering the *T. Haliotoidea* as an indigenous British and Irish species.

GENUS III.—ARION.—Férussac.

Shell an oblong mass of granular, spongy, corneous substance, enveloped in the mantle of the animal, sometimes consisting only of a few granules in a rudimentary condition.

Section I.—Shell oval and concave.

1. ARION HORTENSIS.

Variety 1. Animal black, with gray streaks.

Arion hortensis, Férussac, Moll., 6, pl. 11, f. 4, 5, 6, VIII, a, f. 2, 3, 4; Gray, Med. Rep., 1821; Thompson, Ann. and Mag. Nat. Hist., VII, p. 18; *Limax subfuscatus*, Pfeiffer, pl. 4, f. 20; *Limax hortensis*, Grateloup, Moll. Dax., p. 55, f. 4; *Limacellus variegatus*, Turton, Man., p. 25, pl. 3, f. 16, shell; *Limacella concava*, Brard, p. 121, shell.

Variety 2. Animal gray, with a black streak on both sides.

Arion hortensis, var. β , Alder, Mag. Zool. and Bot., II, p. 105; *Arion circumscriptus*, Johnston, Edin. New Phil. Journ., V, p. 77; *Limax fasciatus*, Nilsson, Fau. Succ., p. 3.

Shell oval, misshapen, and somewhat concave.

Inhabits woods in Great Britain and Ireland; in the latter country, Thompson says it is common throughout the North.

Section II.—Shell, if any, nearly circular, spongy, and rudimentary.

2. ARION EMPIRICORUM.

Arion empiricorum, Férussac, Hist. Moll., 60, p. 17, pl. 1, f. 23; Alder, Mag. Zool. and Bot., II, p. 105; *Arion ater*, Thompson, Ann. and Mag. Nat. Hist., VII, p. 18; *Limax ater*, Linné, Fau. Succ., p. 507; Müller, Verm., II, p. 2; Draper-

naud, p. 122, pl. 9, f. 3, 4, 5, 6; Nunneley, Trans. Phil. Soc. Leeds, p. 46, pl. 1, f. 1, pl. 2, f. 1, pl. 1, f. 1, 3, and 6; *Limax Rufus*, Drapernaud, p. 123, pl. 9, f. 6.

Shell spongy, sub-hemispherical.

This species is very common throughout Great Britain and Ireland, in gardens and woods. Miss M. Ball says the yellow variety is found in the North and South.

GENUS IV.—LIMAX.—Linnæus.

Shell oblong, subquadrate, scutiform, extremely thin, and crystalline; covered with a pale brown epidermis, which extends beyond the margin of the shell; apex rounded, not convolute, but provided with a cavity at the top.

Section I.—Mantle of the animal produced behind; shell depressed.

1. LIMAX MAXIMUS, pl. IX, f. 26.

Limax maximus, Linnæus, Syst. Nat., p. 1081, No. 4; Thompson, Ann. and Mag. Nat. Hist., VI, p. 18; *Limax cinereus*, Müller, Verm., II, p. 8, No. 204; Gmelin, Syst. Nat., I, p. 3101; Alder, Mag. Zool. and Bot., II, p. 105; Forbes, Mal. Mon., p. 6; *Limax antiquorum*, Féruccae, Hist., p. 68, pl. 4, f. 8, a, f. 1, pl. 4, f. 4, shell; *Limax maculatus*, Leach, MSS.; Nunneley, Trans. Phil. Soc. Leeds, I, p. 46, pl. 1, f. 2; *Limacella Parma*, Brard, p. 110, pl. 4, f. 1, 2, 9, 10, shell; *Limacellus Parma*, Turton, Man., p. 24, pl. 2, f. 14, shell; *Limax maximus*, Brown, Illust. Conch., p. 55, pl. 18,* f. 17.

Shell thin, cream-white, subdiaphanous, depressed, slightly concave internally; aperture nearly the whole size of the shell, with the margin of the outer lip membranaceous, and very thin; external surface slightly wrinkled transversely, and sometimes studded with minute, glistening, crystalline particles; apophysis of adhesion, small, prominent, situate on the extremity of the top, or broader end; opposite end rounded, and very thin. Length about six lines; breadth four lines.

This species is common all over Great Britain and Ireland, and the Isle of Man, frequenting the bottoms of hedges and damp situations.

The Rev. B. J. Clarke, of Tuam, has kindly sent me a drawing of a very distinct variety of this animal.

Section II.—Shell depressed; mantle of the animal short, and posteriorly rounded.

2. *LIMAX FLAVUS*, pl. IX, f. 27.

Limax flavus, Linnæus, Syst. Nat., p. 1082; Ib., Fau. Suec., p. 363, No. 2092; Pennant, Brit. Zool., IV, p. 41; Latham, Linna. Trans., I, p. 182; Thompson, Ann. and Mag. Nat. Hist., VI, p. 18; *Limax variegatus*, Drapernaud, p. 127; Féruccac, Prod., p. 21; Ib., Hist. Moll., p. 71, pl. 5, f. 1 to 6; Alder, Mag. Zool. and Bot., II, p. 105; Nunneley, Trans. Phil. Soc. Leeds, I, p. 47, pl. 1, f. 3; *Limax succino colore*, Lister, Conch., pl. 101, f. 6; *Limacella concava*, Brard, p. 121, pl. 4, f. 5, 6, 13, 14, shell; *Limacellus variegatus*, Turton, Man., p. 25, pl. 3, f. 16; *Limax flavus*, Brown, Illust. Conch., p. 55, pl. 18,* f. 18.

Shell extremely thin, shield-shaped, slightly concave; anterior edge a little rounded; posterior end mammilliform; of a pale, yellowish colour.

Frequents cellars, in London and its vicinity, and has been met with at Oxford, Plymouth, Bristol, and Bath; and was discovered at Youghal, Ireland, by Robert Ball, Esq., and has also been found in the North by William Thompson, Esq., of Belfast.

Section III.—Mantle short, truncated behind; shell thick, convex beneath, and oval.

3. *LIMAX CARINATUS*, pl. IX, f. 28.

Limax carinatus, Leach, Moll., p. 73, pl. 8, f. 1; Alder, Mag. Zool. and Bot., II, p. 105; Thompson, Ann. and Mag. Nat. Hist., VI, p. 63; Brown, Illust. Conch., p. 55, pl. 18,* f. 19; *Limax Sowerbii*, Féruccac, Hist. Moll., pl. 8, f. 7, 8; Denson, Mag. Nat. Hist., VI, p. 694, f. 120, a, b; *Limacella unguilata*, Brard, p. 116, pl. 4, f. 3, 4, 11, 12; *Limacellus unguilatus*, Turton, Man., p. 25, pl. 3, f. 15.

Shell oval, or rhombic, rather thick, and convex beneath, of a pale cream-white; margin rather broad, rufous towards the top; destitute of a membrane, and never concave.

Mr. Clarke remarks, that "the peculiar thickening process in the centre gives them the appearance of having a marginal zone, or as if a smaller sized shell were placed on the top and centre of the larger, leaving a rather broad margin, which is usually of a rufous colour towards the top."

Inhabits gardens, in the vicinity of London, and at Hampstead; also at La Bergerie; Monivea, County of Galway, under stones in fields, and in tufted plants in gardens, according to the Rev. B. J. Clarke, by whom it was first noticed in Ireland.

Mr. Thompson (p. 63) mentions a species obtained by him, in 1840, near Clifden, Connemara, Ireland, while on a tour with Professor Forbes, King's College, London, and Robert Ball, Esq., of the Castle, Dublin, which were more nearly allied to the *L. gagates* of Drapernaud, than the British specimens of *L. carinatus*. Mr. Ball has since found it on the Circular road, Dublin.

4. *LIMAX AGRESTIS*, pl. IX, f. 29.

Limax agrestis, Linné, Syst. Nat., p. 1082, No. 6; Gmelin, Linn. Syst. Nat., p. 3101, No. 6; Müller, Verm., II, p. 8, No. 204; Drapernaud, Hist. des Moll., p. 126, pl. 9, f. 9; Sturm, Fau. Abthl., VI, p. 1, pl. 4; Pennant, Brit. Zool., IV, p. 41; Lamarck, An. San. Vert., VI, pt. 2nd, p. 50; Fleming, Brit. An., p. 256; Turton, Brit. Fau., p. 133; Pfeiffer, I, p. 21; Nunneley, Trans. Phil. Soc. Leeds, pl. 1, f. 4; Alder, Mag. Zool. and Bot., II, p. 105; Thompson, Ann. and Mag. Nat. Hist., VI, p. 61; Forbes, Mal. Mon., p. 6; Brown, Illust. Conch., p. 56, pl. 18,* f. 20; *Limacella obliqua*, Brard, p. 148, pl. 4, f. 7, 8, 17, 18, shell; *Limacellus obliquus*, Turton, Man., p. 26, pl. 3, f. 17.

Shell variable in form, very small, thick, hard, and of an oblong square, rounded at the corners; colour, pale yellowish-white, or gray; a little concave, and provided with a membranous edge.

This species is destitute of the abrupt thickening in the centre of the shell, which is so strongly characteristic of *L. carinatus*.

Common in fields throughout Britain; Mr. Clarke found it in Queen's County, and County of Galway, Ireland.

Mr. Clarke considers *L. filans*, var. γ of Féruccac, as belonging to this species.

5. LIMAX GAGATES? VAR., pl. IX, f. 30.

Limax gagates? var., Féruccac? Drapernaud? Brown, Illust. Conch., p. 56, pl. 18,* f. 21; *Limax* No. 4, Clarke, Ann. and Mag. Nat. Hist., VI, p. 19.

Shell oval, somewhat spoon-shaped, pointed above, and rounded below; membranaceous, and subopaque.

Mr. Clarke says this shell differs materially in size and thickness from *L. variegatus*, being smaller, more membranaceous, and less opaque. The colour and markings of the animal are also very different from other British species.

Discovered by the Rev. B. J. Clarke, of Tuam, at Spire Hill, La Bergerie, Queen's County, Ireland, who has most obligingly sent me the use of beautiful drawings of the animal and shell of this as well as of all the other Irish Limacidæ. He says it is always found on trees, and never in cellars and damp vaults, &c., as *L. variegatus*.

Mr. Thompson, in his paper on the Land and Fresh Water Mollusca of Ireland, remarks, "It may be the *L. carinatus* of Leach, or *L. gagates* of Drapernaud;" but I do not think Mr. Clarke's description agrees with either of the above species. I think it more than probable that it is an entirely new species.

FAMILY II.—ANCYLIIDÆ.

Animals fluviatile; they breathe air, respiring on the surface of the water; breathing apparatus situate in a bag-shaped cavity on the back of the neck.

GENUS V.—ANCYLUS.—Müller.

Shell thin, obliquely conical, patelliform; vertex somewhat pointed, short, turned backwards, and inwards, but not spiral; aperture oval, or oblong, with the margins simple and entire.

Section I.—*Animals sinistral.*

1. ANCYLUS FLUVIATILIS, pl. X, f. 1, 2, 3.

Ancylus fluviatilis, Müller, Verm., II, p. 194, No. 381; Drapernaud, p. 48, pl. 2, f. 23, 24; Pfeiffer, p. 107, pl. 4, f. 44, 45; Brard, p. 200, pl. 7, f. 3; Turton, Man., p. 140, pl. 10, f. 125; Alder, Mag. Zool. and Bot., II, p. 116; Thompson, Ann. and

Mag. Nat. Hist., VI, p. 47; Lamarck, VI, pt. 2nd, p. 27; *Patella fluviatilis*, Montagu, p. 484; Linné, p. 1253; Da Costa, p. 48, pl. 3, f. 8; *Patella lacustris*, Donovan, pl. 147, f. 2; Maton and Rackett, p. 232; Brown, Ency. Brit., VI, p. 466; Ib., Wernerian Mem., II, p. 533; *Crepidula lacustris*, Fleming, Edin. Ency.; *Ancylus fluviatilis*, Brown, Illust. Conch., p. 59, pl. 12, f. 1, 4, and 6; Ib., First Ed., pl. 36, f. 1, 4, and 6.

Shell subconic, with the vertex sharp, slightly recurved, and situate near one end, sometimes a little hooked; pellucid, horn-coloured, covered with a dark greenish-brown epidermis, sometimes of a paler hue, beneath which the shell is of a brown horn-colour, and with a few concentric wrinkles; aperture oval; marginal lip thin; inside glossy, of a bluish-white. Length three-eighths of an inch; breadth a quarter of an inch.

A variety is sometimes found, particularly in a stream near Folkstone, in Kent, finely striated longitudinally. Montagu says this variety is so strongly striated, that it was by some considered a distinct species. He adds, "these were of an inferior size, and covered with a dusky epidermis, differing in nothing but the striae being more conspicuous."

Common in most rivers and streams in Great Britain and Ireland, adhering to stones at the bottom.

Section II.—Animals dextral.

2. *ANCYLUS LACUSTRIS*, pl. X, f. 4, 5, 6.

Ancylus lacustris, Müller, Verm., II, p. 199; Drapernaud, p. 47, pl. 2, f. 25, 26, 27; Pfeiffer, p. 109, pl. 4, f. 46; Lamarck, VI, pt. 2nd, p. 27; Fleming, Brit. An., p. 280; Alder, Mag. Zool. and Bot., II, p. 116; Turton, Man., p. 141, pl. 10, f. 126; Thompson, Ann. and Mag. Nat. Hist., VI, p. 47; *Patella lacustris*, Linné, Syst. Nat., p. 1260, No. 769; Pennant, Brit. Zool., IV, p. 142; Montagu, Test. Brit., p. 484; Donovan, Brit. Sh., pl. 150; Brown, Wernerian Mem., II, p. 533; Ib., Ency. Brit., VI, p. 466; *Patella oblonga*, Maton and Rackett, Linn. Tr., VIII, p. 233; Lightfoot, Phil. Trans., LXXVI, p. 168, pl. 3, f. 1; *Ancylus lacustris*, Brown, Illust. Conch., p. 60, pl. 12, f. 3, 5, and 7; Ib., First Ed., pl. 36, f. 3, 5, and 7.

Shell conical, and of a much elongated, oval form, compressed on the sides, thin, smooth, but not glossy, or slightly wrinkled, nearly membranaceous, subpellucid, of a pale horn-

colour, covered with a yellowish-green epidermis; vertex small, acute, placed somewhat posteriorly, a little reflected, obliquely inclining towards the narrower end; aperture oblong-oval; margin membranaceous; inside smooth, glossy, and of a bluish-white. Length a little more than a quarter of an inch; breadth about half its length.

Found in lakes and still ditches, in many situations in Great Britain and Ireland, adhering to aquatic plants. We may particularise the Stour, Dorsetshire; the Thames, near Windsor; Windermere; and in a pool near the Eccles station, on the Liverpool and Manchester Railway; Duddingston Loch, near Edinburgh; and in Ireland, I met with it in a millrace, near Naas; Thompson gives as localities, *Potamogeton*; in the drains of the bog meadows, near Belfast; the Lagan canal; in a pond at Moira, County of Down; and various other situations.

CLASS II.

CONCHIFERA; OR BIVALVES.

Animals soft, without articulations, destitute of a head or organs of vision, and always fixed within a BIVALVE shell; provided with external branchiæ, a simple circulation, and an unilocular heart.

All the species are aquatic, living either in the sea or fresh water. None of the animals have an internal shell. The body is invariably soft, and the mouth is situated near the left side of the hinge.

ORDER MONOMYARIA.

Animals provided with but one muscle of attachment, or adductor muscle, which leaves one subcentral muscular impression inside of each valve.

FAMILY I.—MYTILACEA.

Hinge with a linear, subinferior, marginal ligament, very entire, and occupies a considerable portion of the anterior margin; shells generally foliaceous.

GENUS I.—DREISSENA.—Van Beneden.

Shell boat-shaped, or mytiliform; valves carinated; ligament internal, except in a little fissure in both valves externally; a rude cardinal tooth is situate under the umbo in the right valve, which locks into a corresponding cavity in the left valve; in the umbonal angle of both valves is placed a transverse partition, for sustaining a closing muscle; anterior marginal seam with a fissure near its centre, for the passage of the byssus.

1. DREISSENA POLYMORPHA, pl. X, f. 7, 8, 9, 10, 11, 12.

Dreissena polymorpha, Van Beneden, Ann. Sci. Nat., 1835, p. 210, pl. 8, f. 1 to 11; Strickland, Mag. Nat. Hist., 1838, p. 361; Alder, Mag. Zool. and Bot., II, p. 117; *Tichogonia Chemnitzi*, Rossmassler, I, p. 113, pl. 3, f. 69; *Mytilus polymorphus*, Pallus, Voy. Russ. App., p. 211; *Mytilus Wolgæ*, Chemnitz, XI, p. 205, f. 2028; *Mytilus Hagenii*, Baer, Fér. Bull. Sci. Nat., 1826, p. 140; —? *Volgensis*, Gray, Ann. Phil., 1825; *Dreissena polymorpha*, Brown, Illust. Conch., p. 76, pl. 29, f. 4, 5, 6, 7, 8, 9.

Shell cymbiform, extremely flat in front, and acutely carinated behind; umbones incurved, pointing anteriorly, turned downwards at the points, and very closely pressed together; anterior side with an elongated, cordiform groove, reaching nearly to the centre of the valves, towards the base of which is a large, wide, elongated hiatus, acute at both ends, always situate in the right valve, for the passage of the byssus; the edge of the opposite valve being always entire; external surface covered with a rather strong, olivaceous, irregularly wrinkled epidermis, with indications of nearly obsolete, longitudinal, divergent ribs, or elevations; beneath this the shell is beautifully mottled with zigzag brown, or purple, transverse clouds or markings; inside dull white, with the pallial and muscular impressions of a purple hue, and very glossy.

This species is subject to great variety in length and breadth, varying from an inch and five-eighths to an inch in length. Some are elongated and narrow; others short and broad. It inhabits the commercial docks in various parts of Great Britain, and is to be met with in most of our canals. It is common in the Bridgewater canal, and also in many places in the canal betwixt Manchester and Hull; and was found by my friend Mr. Stark in the Union canal, near Edinburgh, in 1834. The animals are gregarious, generally found adhering in clusters by a strong byssus.

This shell is not an aboriginal of Britain, being a native of the Volga, the Danube, and other continental rivers, and has been introduced upon timber; but is now so generally diffused throughout Britain, that it may fairly be considered as a British shell.

ORDER DIMYAIRA.

Shell provided with two separate lateral muscular impressions.

SUB-DIVISION I.—LAMELLIPEDES.

FAMILY I.—NAYADES.

Shells inhabiting fresh waters; the hinge sometimes with an irregular, simple, or complex tooth, and a longitudinal prolonged one, and sometimes none. Some have a compound muscular impression; and the umbo is frequently decorticated.

GENUS I.—ANODON.—Bruguière.

Shell equivalve, inequilateral, and transverse, for the most part very thin; hinge line nearly straight; hinge glabrous, with smooth lamina, destitute of cardinal teeth, truncated, or forming a sinus at the anterior end, terminating the apex of the shell; two lateral remote, muscular impressions, the posterior one being compound; pallial impression entire, and seldom distinctly marked; ligament linear, external, sunk in a cleft at the anterior extremity; inside pearlaceous; external surface covered with a shining epidermis.

1. ANODON CYGNEUS.

Anodonta Cygnea, Lamarck, An. San. Vert., VI, p. 84; Draperaud, Hist. Nat. des Moll., p. 134, pl. 11, f. 6, and pl. 12, f. 1; *Anodon Cygneus*, Turton, Brit. Biv., p. 239; *Mytilus Cygneus*, Linnaeus, Syst. Nat., p. 1158; Gmelin, p. 3355; Montagu, Test. Brit., p. 170.

Shell thin, oblong-ovate, tumid; anterior side short, rounded; posterior slope elongated, and somewhat pointed, more or less angulated, and subcompressed; umbones but slightly produced, and placed nearest the anterior side.

This species is subject to great variety of form. These varieties have, by different authors, been considered distinct species; but we have not been able to detect any specific difference in the animal inhabitant. There are, however, several well-marked and permanent varieties, the distinguishing charac-

teristics of which we shall endeavour to point out. Most of the Anodons undergo considerable change, in their progress from the young to the adult condition.

Variety 1. CYGNEUS, pl. XI, f. 1, 2, 3.

Anodonta Cygnea, Pfeiffer, I, p. 111, pl. 6, f. 4; Rossmassler, I, p. 111, pl. 3, f. 67; Ib., V, VI, pl. 25, f. 342; *Mytilus Cygneus*, Pennant, Brit. Zool., IV, p. 113, pl. 67, f. 78; Donovan, Brit. Sh., pl. 55 and 113; Maton and Rackett, Linn. Tr., VIII, p. 109, pl. 3 A, f. 2; Sheppard, Linn. Trans., XIII, pl. 5, f. 3; Montagu, Test. Brit., p. 170; Fleming, Edin. Ency., VII, p. 96, pl. 205, f. 16; Thompson, Ann. and Mag. Nat. Hist., VI, p. 40; *Anodon Cygnea*, Alder, Mag. Zool. and Bot., II, p. 117; *Anodon Cygneus*, Brown, Illust. Conch., p. 79, pl. 28, f. 1, 3, 4.

Shell rather thin, oblong-ovate, inflated; umbo small, placed near the anterior side, which is rounded and short; posterior side elongated, with the hinge line nearly parallel, or slightly oblique, from whence it suddenly slopes into a subrostrated form; lower margin rounded, gradually sloping upwards towards the posterior side; external surface concentrically wrinkled, and covered with an olive-green, shining epidermis; inside pearlaceous.

Figs. 2 and 3, young shells.

Found in the river Ouse, at York; the Thames, near Windsor; in the ponds at Elmingham Park, the seat of the Countess of Dysart, Suffolk; Loch Ketrine, Scotland; in the Grand Canal, and the Moynaghhs, County of Armagh, Ireland; and many other lakes and rivers in Britain and Ireland.

Variety 2. CELLENSIS, pl. XII, f. 1, 2.

Anodonta cellensis, Encyclopedia Methodique, pl. 202; Pfeiffer, I, p. 110, pl. 6, f. 1; Rossmassler, IV, p. 23, pl. 19, f. 280; *Anodon cellensis*, Alder, Mag. Zool. and Bot., II, p. 118; *Anodon Cygneus*, Drapernaud, Moll., pl. 12, f. 1; Turton, Man., pl. 1, f. 8; *Anodon paludosus*, Turton, Brit. Biv., p. 240, pl. 15, f. 6; *Anodonta sulcata*, Lamarek, An. San. Vert., V, p. 85; *Mytilus cellensis*, Schroeter, Flussconch., pl. 2, f. 1; *Mytilus anatinus*, Pennant, Brit. Zool., IV, p. 113, pl. 68, f. 79; Maton and Rackett, Linn. Tr., VIII, p. 110, pl. 3 A, f. 1; Montagu, Test. Brit., p. 171; Sheppard, Linn. Trans., XIII, pl. 5, f. 5; Fleming, Edin. Ency., VII, p. 99, pl. 204, f. 14; *Anodon cellensis*, Brown, Illust. Conch., p. 79, pl. 28,* f. 1, 2.

Shell considerably elongated, with numerous, concentric, and rather deep wrinkles; hinge line and base nearly parallel to each other; anterior side short; posterior side very long; the upper and under sides both suddenly contracting into a substrated form; covered with a greenish, shining epidermis.

This variety differs from the *Cygneus*, in its form being much more lengthened, and in the hinge and basal lines being both nearly straight, and almost parallel to each other.

Fig. 2 represents the young shell.

This shell varies considerably in size in different localities. It has been found in the pond of my friend Thomas Glover, Esq., at Smedley Hill, near Manchester, measuring three inches and a quarter in length, and six and a half in breadth.

Found in the pond of the Infirmary, Manchester, and in many other ponds in the neighbourhood; Borrodale, Westmoreland; Loch Vennachar, Perthshire; the loch and ponds at Duddingston, near Edinburgh; and in the Grand Canal, near Shannon Harbour, King's County, Ireland.

This variety is more commonly diffused throughout Britain than any of the others.

Variety 3. ANATINA, pl. XIII.

Anodontia Anatina, Lamarek, An. San. Vert., VI, pt. 1st, p. 85; Pfeiffer, I, p. 112, pl. 6, f. 2; Rossmassler, V, VI, p. 57, pl. 30, f. 417 to 420; Thompson, Ann. and Mag. Nat. Hist., VI, p. 55; Alder, Mag. Zool. and Bot., II, p. 118; Brown, Illust. Conch., p. 79, pl. 29, f. 1.

Shell thin, subcompressed; anterior side very short, and rounded; hinge line abruptly ascending into an acute angle, and suddenly descends in a hollowed line to a somewhat truncated beak, which is a little produced at its lower angle; from the anterior side the basal line suddenly descends in a rounded form, and again makes an acute upwards angle, to meet the posterior line; outer surface covered with a shining, fresh-green epidermis.

The posterior side of the shell is very long, and much broader than in any of the former varieties.

This variety is easily distinguished from its congeners, by the posterior side being much broader than any of them, and from the very abrupt upwards angle of the hinge line. A modification of this variety occurs in the river Cam, near Cambridge.

It is considerably more inflated than the ordinary form of *Anatinus*, and is of a small size. Its length is one inch and three-quarters; its breadth three inches and a quarter; and its thickness one inch and one-eighth.

Found at Southport, Lancashire; Loch Leven, Kinrossshire; Prestwick Carr, Northumberland, where we obtained the beautiful and highly characteristic specimen from which our figure was taken; and also in the rivers Shannon and Bresna, and the Grand Canal, Ireland.

Variety 4. STAGNALIS, pl. XIV.

Mytilus stagnalis, Sowerby, Brit. Miscell., pl. 16; *Mytilus Cygneus*, Maton and Rackett, Linn. Tr., VIII, p. 109; Montagu, Test. Brit., p. 171; *Anodon stagnalis*, Brown, Illust. Conch., p. 79, pl. 28, f. 2.

Shell thin, much inflated; umbones subcentral; anterior side rounded, with a slight angle above; hinge line arcuated; posterior side slightly hollowed, and terminating in a subacute beak; basal line nearly semicircular; outer surface with an olivaceous, shining epidermis; very pearlaceous and iridescent internally.

In the younger condition, the colour is of a bright yellowish-green.

Found in the pond of Kew Garden; in the Canal Wharf at Bolton Bridge, Lancashire; and in the canal at Keighley.

Variety 5. INTERMEDIA, pl. XXX, f. 5, 6.

Anodonta intermedia, Lamarck, Hist. An. San. Vert., VI, p. 86; Pfeiffer, I, p. 113, pl. 6, f. 3; Alder, Mag. Zool. and Bot., II, p. 118; Brown, Illust. Conch., p. 79, pl. 30, f. 5, 6.

Shell very thin, with the hinge line almost straight, and, ascending, forming an angle, from whence it descends in nearly a parallel direction, assuming an obtuse point; anterior side slightly angulated; the basal line arcuated, and descending considerably, in consequence of which the posterior side is very deep, being a third more than the anterior one; surface covered with a very bright yellowish-green epidermis, frequently with divergent rays of a deeper hue; ligament not protruding beyond the margin of the hinge line.

Found in the canal, near Keighley.

Variety 6. COMPLANATA, pl. XII, f. 3, 4.

Anodonta complanata, Ziegler Museum; Rossmassler, I, p. 112, pl. 3, f. 68, a; *Anodonta compressa*, Menke, Syn., p. 106;

a variety, Rossmassler, IV, p. 24, pl. 20, f. 283; Ziegler Mus.; *Anodonta rhomboidea*, Schlüt; *Anodon complanata*, Brown, Illust. Conch., p. 80, pl. 28,* f. 6, 7.

Shell very thin, compressed, elliptically-ovate; the superior, or hinge margin ascending, in a somewhat curved line, to the termination of the ligament, from whence it descends and terminates in a produced beak, quite at the lower angle of the posterior side; basal line very straight, with a slight curvature; anterior margin rounded, and narrow, near to which the slightly developed umbo is situate; whole surface with concentric wrinkles, and covered with a reddish-brown epidermis.

This variety is found in the river Calder, near Wakefield; and it has been forwarded to me from the Trent, at Repton, near Burton, by the kindness of Sir Oswald Mosley, Bart., a gentleman distinguished for the deep interest which he takes in the advancement of Natural Science.

Variety 7. AVONENSIS, pl. XVIII, f. 3.

Mytilus Avonensis, Montagu, Test. Brit., p. 172; Turton, Brit. Fau., p. 165; *Mytilus Cygneus*, var. β , Maton and Rackett, Linn. Tr., VIII, p. 110, pl. 3 A, f. 3; Fleming, Edin. Ency., VII, p. 99, pl. 206, f. 5; *Anodonta Anatina*, var., Rossmassler, VI, p. 57, pl. 30, f. 418; *Anodon Avonensis*, Brown, Illust. Conch., p. 80, pl. 29, f. 2.

Shell ovoid, or subrhomboidal, ventricose, rather thick, in some specimens very thick; anterior margin rounded, short; posterior margin long, and pointed; hinge line subarcuated; basal line slightly curved; external surface generally rough, with sharp concentric wrinkles, covered with a very thick, variously coloured, rather dull epidermis; sometimes olivaceous, and at others reddish-brown.

This variety is subject to considerable variation of form and size, and is in general well marked. It is usually of a dull white internally, with but little of the pearly lustre so prevalent in its congeners.

Found in the Avon and New River; also near Tisbury, Wiltshire; the Trent, near Burton; near Steeton; the canal, near Halifax, and of a large size in the canal, near Sowerby Bridge, Yorkshire.

Variety 8. PONDEROSA, pl. XV, f. 1, 2, 3.

Anodon ponderosa, Pfeiffer, II, p. 31, pl. 4, f. 1 to 6; Ross-massler, IV, p. 24, pl. 20, f. 282; Brown, Illust. Conch., p. 80, pl. 30, f. 1, 2, and pl. 29, f. 3; *Mytilus Cygneus*, var. β , Maton and Rackett, Linn. Tr., VIII, p. 109, pl. 3 A, f. 3.

Shell large, thick, ponderous, rhombic-oval, very ventricose; externally wrinkled; with the epidermis rough, fibrous, and semivillous at the rounded anterior extremity, and at the base; posterior side long, subrostrated, and subtruncated at its extremity; base but slightly bent, or nearly parallel; hinge line considerably arcuated, with a long ligament, from whence it somewhat abruptly descends; beneath the ligament a sinuated groove, rising abruptly, and forming a ventricose disk; umbones rather tumid, and decorticated; the ligamentary sinus small, subcordate; inside bluish-white. Length two inches and three-eighths; breadth four inches and five-eighths; thickness two inches and a half.

I was favoured with this interesting variety by my friend Mr. Henry Johnson, Curator of the Museum, Royal Institution, Liverpool, who found it at Otterspool, Aigburth, on the property of John Moss, Esq., who has since most kindly supplied me with a complete series for investigation. It also occurs in Loch End, near Edinburgh. Another handsome variety of this shell inhabits the lake at Rolleston, the seat of Sir Oswald Mosley, Bart., near Burton-upon-Trent, to whom I am indebted for a fine series of specimens.

The latter variety is somewhat more acuminate in the beaked side, and devoid of the villosoity of the Otterspool variety, in which respect it agrees with that found at Loch End.

This shell has been mistaken for the *A. Avonensis*, by some British Naturalists. It is, however, considerably more inflated, in proportion to its size, and a third larger.

Variety 9. SUBRHOMBEA, pl. XVI, f. 3, 4.

Anodon subrhombaea, Brown, MSS.; Ib., Illust. Conch., p. 80, pl. 30, f. 3, 4; *Anodonta piscinalis*, var.? Rossmassler, VI, pl. 30, f. 416.

Shell thick, subrhomboidal, rather inflated; anterior side slightly produced; hinge line nearly parallel, and ascending towards the posterior side; ligament long, subarcuated, from

whence it suddenly declines towards the somewhat truncated extremity; basal line considerably arcuated; exterior surface but slightly wrinkled transversely; umbones small, and acute; inside bluish-white, with faint pearlaceous reflections.

This variety differs from the *A. piscinalis*, in being more ponderous, and more inflated, in the hinge line being more arcuated, and in being less rostrated.

Found in the Irwell, near Manchester, by my esteemed friend Mr. Samuel Gibson, of Hebden Bridge, Yorkshire, to whom I am indebted for specimens; and also in a lodge at Dinting Vale, near Glossop, by my friend Mr. Robert Derbyshire, of Manchester.

Variety 10. PISCINALIS, pl. XVII, f. 3, 4, 5.

Anodonta piscinalis, Nilsson, p. 116, No. 3; Drapernaud, Hist. des Moll., pl. 12, f. 2; Rossmassler, IV, p. 23, pl. 19, f. 281; *Anodonta ventricosa*, Pfeiffer, II, p. 30, pl. 3, f. 6; Alder, Mag. Zool. and Bot., II, p. 118; wood cut, Kenyon, Mag. Nat. Hist., I, f. 188; *Mytilus maculatus*, Sheppard, Linn. Trans., XIII, pl. 5, f. 6, young shell; *Anodon piscinalis*, Brown, Illust. Conch., p. 80, pl. 28,* f. 3, 4, 5.

Shell subovate, ventricose, thick; hinge line ascending in a waved, subarcuated sweep towards the posterior side, and descending in a hollow bent line, ending in a produced, turned upwards beak; basal margin considerably arcuated, and ascending rather abruptly towards the posterior side; outer surface covered with a thick, shining, olivaceous epidermis, with many obscure, radiating lines of a darker hue.

Found in the canal, near Birmingham; and in Combermere, Cheshire, where I procured an extensive series, while on a visit at the Abbey, through the polite attention of Viscount and Lady Combermere.

Variety 11. ROSTRATA, pl. XVI, f. 1, 2.

Anodonta rostrata, Kokeil Museum; Rossmassler, IV, p. 25, pl. 20, f. 284; Brown, Illust. Conch., p. 80, pl. 28,* f. 8, 9.

Shell compressed, considerably elongated transversely, thin; anterior side very short; posterior side very long, and produced into a somewhat lengthened, blunted beak; hinge line arcuated, and ascending, its greatest altitude being nearly central; anterior side rather narrow, and rounded; posterior side descending in a waved line; basal line nearly parallel, and undulating;

umbones convex; outside rather smooth, and covered with a blackish-brown epidermis.

Said to be found in ponds at Liverpool, but I have never met with one from that locality.

An extremely thin and lengthened variety, which is covered with a reddish-brown epidermis, and rather rough on the surface. It inhabits Loch Kettrine, Perthshire. Our figure is taken from a specimen procured in that locality.

Variety 12. CONTORTA, pl. XVIII, f. 1, 2.

Anodon contorta, Brown, Illust. Conch., p. 81, pl. 30, f. 7, 8.

Shell of moderate thickness; hinge line quite parallel; the ligament hardly protruding beyond the hinge line; umbones very flat; anterior side very short, narrow, and a little pointed; posterior side very broad, subrostrated, with a remarkable flexure, caused by a strong rib-like process, emanating in both valves from the umbones, and thickening towards the margin; the basal line prominently arcuated; shell considerably inflated, one valve much more convex than the other.

This remarkable variety was found by Thomas Glover, Esq., of Smedley Hill, inhabiting ditches, in a flat meadow, not far from the School House, at Repton, near Burton-upon-Trent. Upwards of twenty specimens were obtained by him. Sir Oswald Mosley kindly undertook to procure specimens of this desirable shell; but on visiting the spot, found the locality completely destroyed, in consequence of a new bridge having lately been built across the Trent; and although the ditch in which they were found communicated with the river, yet no traces of the shell could be found.

GENUS II.—*UNIO*.—Bruguière.

Shell transverse, equivalve, inequilateral, free, sometimes subcordate, or suborbicular; pearlaceous within; generally covered with a dark olivaceous epidermis, which is usually decorticated on the umbones; hinge provided with a short, irregular, simple, or a double compound tooth, which is almost always striated; with two elongated, compressed, lateral teeth, the front one produced, sometimes obsolete; two muscular impressions in each valve, the superior one compound, or composed of several divisions; ligament external.

1. *UNIO PICTORUM*, pl. XIX, f. 1, 2, 3, 4.

Unio pictorum, Lamarck, An. San. Vert., VI, p. 77; Ency. Meth., pl. 248, f. 4; Pfeiffer, I, p. 115, pl. 5, f. 9, 10; Drapernaud, Moll., pl. 11, f. 4; Rossmassler, I, pl. 3, f. 71, a, b; Ib., III, p. 23, pl. 13, f. 197; Ib., IX and X, p. 10, pl. 45, f. 587 to 590; *Unio rostratus*, Pfeiffer, I, p. 114, pl. 5, f. 8; *Mya pictorum*, Sturm, Fauna, VI, p. 2, f. a; Schroeter, Flussconch., pl. 4, f. 6; Wood, Conch., p. 104, pl. 19, f. 3, 4; Donovan, Brit. Sh., III, pl. 89; *Mya ovalis*, Montagu, Test. Brit., p. 34; *Mysca pictorum*, Turton, Man., p. 20, pl. 2, f. 11; Gray's Turton, p. 295, pl. 2, f. 11, badly figured; *Unio pictorum*, Brown, Illust. Conch., p. 81, pl. 31, f. 7, 8, 9, 10, 11; Ib., First Ed., pl. 26, f. 4.

Shell thin, transversely oblong-oval, ventricose; umbones a little produced, and placed near to the anterior side, which is short, and rounded; posterior side elongated, and somewhat pointed; hinge line slightly bent; basal line nearly parallel, and a little hollowed in the centre; hinge furnished with a strong, double, compressed, elevated, elongated, crested, crenated, cardinal tooth in the left valve, with a perpendicularly papillose, striated cleft on the side of its posterior portion, on which the tooth of the opposite valve rests, which locks into a space above the shorter cardinal tooth in the opposite valve; lateral teeth in both valves long, narrow, and sunk at the umbones,—from whence they take their rise,—becoming more elevated and acute as they diverge, and extend the same length as the ligament; inside highly pearlaceous; varying in different specimens from bluish-white to a rich salmon-colour, with faint, nearly obsolete radiations, extending from the umbones to the margins; pallial impressions well marked; anterior muscular impressions very deep; posterior ones distinctly defined; outside covered with a smooth, shining, yellowish-green epidermis, but varying in colour from different localities; with very indistinct, nearly obsolete, divergent grooves, radiating from the umbones to the margins; and with transverse, concentric, slight furrows, and very irregular, transverse striae, most conspicuous towards the sides.

Fig. 7, pl. XXI, is an external view of the teeth of the hinge.

Found in the river Ouse, at York; the Aire, near Gargrave;

the Severn, near Shrewsbury; in the Aire, near Skipton; the Avon, near Leamington, Warwickshire; and several other slow running rivers and lakes in Britain.

Variety 1, pl. XIX, f. 1 and 4.

Rossmassler, III, p. 23, pl. 13, f. 196; Ib., I, p. 118, pl. 3, f. 71, *a, b*; Brown, Illust. Conch., p. 81, pl. 31, f. 7 and 10.

The length somewhat more than two-fifths of its breadth; thickness a third more than its length. This is the ordinary form of the species.

Found in the Ouse, at York; the Severn, near Shrewsbury; the canal, near Birmingham; and Sir Oswald Mosley, Bart., sent me some beautiful specimens, from the lake at Rolleston, with the insides of a rich nacreous, pale salmon-colour. In this locality they grow to a very large size, measuring an inch and three-quarters in length, and upwards of four inches in breadth.

Variety 2, pl. XIX, f. 3.

Rossmassler, I, p. 117, pl. 3, f. 70, *a*, *Unio tumidius*; Brown, Illust. Conch., p. 81, pl. 31, f. 8.

The posterior side more pointed, that side gradually diminishing both above and below, from the umbones. Length five-tenths of its breadth; thickness half its length; cardinal and lateral teeth longer and more prominent than in the first variety.

Inhabits the Aire, near Gargrave; and the river Brathay, which empties itself into Windermere, near Ambleside.

Variety 3, pl. XIX, f. 2.

Brown, Illust. Conch., p. 81, pl. 31, f. 9.

Considerably longer than the former two varieties, being nearly a third, in proportion to its breadth; the umbones more central and prominent; and somewhat more inflated.

Found in the Don, at Sheffield.

2. *UNIO DESHAYSII*, pl. XX, f. 3, 4.

Unio Deshayssii, Rossmassler, III, p. 23, pl. 13, f. 197; Gibson, MSS.; Brown, Illust. Conch., p. 81, pl. 32, f. 1, 2, 3, 4.

Shell thickish, much elongated transversely; hinge line slightly curved; basal line nearly parallel, slightly waved in the centre, ascending rather abruptly towards the posterior side, and forming a subrotundate termination; umbones prominent, placed very near the anterior side, which is short, and rounded; pos-

terior side slightly gaping, much elongated, but not subrotund and subangulated; produced by the somewhat elevated ridge, which diverges from the umbones to the extreme point of the valve; cardinal teeth small, compressed, minutely serrated; double, and lamelliform, elongated in the left valve, with a deep, perpendicularly sulcated sinus in its side, for the reception of the tooth of the right valve; the portion of the tooth next the umbo somewhat acute; lateral tooth long and double in the left valve, single and sunk towards the umbo, and nearly parallel; lateral tooth of the right valve single, depressed towards the umbo, but ascending, and more acute, as it diverges from the umbo; inside bluish-white, and iridescent; muscular impressions very deep; pallial impression well defined; outside of a dark olive-green, and with rather deep, concentric wrinkles.

Figs. 3 and 4, pl. XXI, exhibit the external and internal appearance of the teeth.

This species differs from *U. pictorum*, in its general length being more uniform, and in being broader at the posterior side, and less acute; in the teeth being much smaller, and less elevated, as well as in the crenulations on their upper side being less distinct, and less regular; in the shell being much thicker, and its posterior side being considerably shorter.

Found in the Wharf, near Ottley; the Aire, near Keighley; the Wharf, near Bolton Bridge; and the Don, near Sheffield.

3. *UNIO ROSTRATA*, pl. XX, f. 1, 2.

Unio rostrata, Kokeil Museum; Alder, Mag. Zool. and Bot., II, p. 118; Lamarck, An. San. Vert., VI, pt. 1st, p. 77, No. 31; Brown, Illust. Conch., p. 82, pl. 32, f. 9, 10, 11, 12; *Unio elongatata*, Pfeiffer, II, p. 35, pl. 8, f. 5, 6; *Unio pictorum*, var., Nilsson, I, p. 118, f f; Ib., III, p. 23, f f; Rossmassler, VI, p. 55, pl. 29, f. 409.

Shell greatly elongated transversely; umbones very flat, placed near the anterior side; hinge line but very little arcuated, as far as the extremity of the lateral teeth, from whence it suddenly slopes both above and below, terminating in a somewhat rostrated form; basal line nearly parallel; primary teeth rather thick, and serrated at the edge; lateral teeth long, and considerably elevated; anterior muscular impression moderately sized, and deeply sunk; below the

umbones, there are indications of remote, nearly obsolete striae; internal surface of a bluish-white, with iridescent reflections. Length not a third of its breadth; thickness four-fifths of its length.

Figs. 1 and 2, pl. XXI, external and internal representation of the teeth.

This shell tapers more abruptly in thinness towards the posterior side, than any of its British congeners; and is considerably more obtuse at its anterior side, than the *U. pictorum*; but its much more elongated form, will at once distinguish it from that shell.

I found this species in the canal, near Hull; and William Thompson, Esq., of Belfast, procured it in the Avon, near Leamington.

4. *UNIO TUMIDUS*, pl. XXI, f. 8, 9.

Unio tumidus, Retzius, Nova Testaceor. Genera, p. 17, No. 3; *Unio tumida*, Pfeiffer, II, p. 34, pl. 7, f. 2, 3, and pl. 8, f. 1, 2; Rossmassler, II, p. 117, pl. 3, f. 70 b; Ib., III, p. 27, pl. 3, f. 202, 203; Alder, Mag. Zool. and Bot., II, p. 118; *Mysca solida*, Turton, Man., p. 22, pl. 2, f. 13; Ib., Conch. Dict., p. 246, pl. 16, f. 2; *Unio tumidus*, Brown, Illust. Conch., p. 82, pl. 32, f. 5, 6, 7, 8.

Shell very thick, solid, cuneiform, transversely oblong-ovate, much inflated; umbones produced, and placed very close, situate near one extremity; anterior side short, rounded; posterior side long, gradually sloping from the umbones both above and below, and terminating in a subtruncated beak; cardinal tooth large, single, thick, elevated, and finely serrated at the edge, in the right valve, and double in the opposite valve; muscular impressions small, and deeply sunk both before and behind; pallial impression strongly defined; external surface with rather strong, concentric wrinkles, and the whole of a reddish-brown, slightly tinged with olivaceous-green; inside white, with but little iridescent lustre. Length half its breadth; thickness four-fifths of its length.

Figs. 5 and 6, pl. XXI, external and internal representation of the teeth.

Found in the New River, near London; and the Avon, near Leamington, Warwickshire.

5. *UNIO OVALIS*, pl. XVIII, f. 4, 5.

Unio ovalis, Leach, MSS., p. 10; *Mya ovalis*, Montagu, Test. Brit., p. 563; *Mya depressa*, Donovan, Brit. Sh., III, pl. 101; *Mya ovata*, Donovan, Brit. Sh., IV, pl. 122, f. 1, 2, 3; *Mysca ovata*, Turton, Man., p. 21, pl. 2, f. 12; *Mysca solida*, Turton, Biv., p. 246, pl. 16, f. 2; *Unio tumidus*, Rossmassler, I, pl. 14, f. 204; *Unio tumidus*, var., Rossmassler, VIII, p. 41, pl. 40, f. 542; *Unio ovalis*, Brown, Illust. Conch., p. 82, pl. 31, f. 12, 13, 14; Ib., First Ed., pl. 26, f. 2.

Shell strong, thick, transversely ovate; hinge line arcuated; umbones prominent, wrinkled, and closely approximate; right valve with a strong, double, erect, cardinal tooth, the higher portion situate immediately below the umbo, considerably elevated above the margin, and two long, oblique, lateral teeth; muscular impressions of moderate size, the anterior ones deep; pallial impression deeply defined; left valve with a single, erect, oblique, cardinal tooth, and a long, elevated, lateral tooth, which fits into the cleft between those of the opposite valve; inside iridescent, and of a pale reddish-salmon colour, and the posterior side of the valves often rough and irregularly wrinkled; outside usually with strong, concentric lines of growth, which are often foliaceous at the posterior side, and of an olivaceous-brown colour; the umbones generally redder, and frequently with longitudinal radiations of pale yellow, or buff. Length upwards of three-fifths of its breadth; thickness not two-fifths.

Fig. 14, pl. XXI, external representation of the teeth.

This species will be distinguished from the *tumidus*, by its more oval form, and in the posterior side being less produced, as well as by its teeth being thicker, the central portion of that in the right valve not so acutely notched on its edge, and rather more elevated; and the shell is much less inflated.

Found in the Aire, near Skipton; the Ouse, above York; the Severn, near Shrewsbury; at Kirkstal Bridge, near Leeds; and in the canal, near Burnley.

6. *UNIO BATAVUS*, pl. XVIII, f. 6, 7, 8, and pl. XXI, f. 10, 11.

Unio Batavus, Lamarck, An. Soc. Vert., VI, pt. 1st, p. 78, No. 33; Nilsson, p. 112, No. 8; Pfeiffer, I, p. 115, pl. 5, f. 14; Rossmassler, II, p. 20, pl. 8, f. 128, a, b; Draperaud, pl. 11,

f. 3; Brown, Illust. Conch., p. 82, pl. 31, f. 3, 3,* 4, 5, 6; Ib., First Ed., pl. 26, f. 3; *Mya pictorum*, Donovan, Brit. Sh., pl. 174; Wood, Conch., p. 403, pl. 19, f. 1, 2; *Mysca Batava*, Turton, Man., p. 20, pl. 2, f. 10.

Shell inflated, oval; hinge line subarcuated; posterior side but very slightly produced; umbones rounded, placed near to one side, and a little apart from each other; anterior muscular impressions small, and deep; pallial impression but slightly defined; inside of a rich pearlaceous lustre; exterior surface of a yellowish-green, frequently beautifully radiated with darker green; lines of growth not deep; basal line arcuated. Length three-fifths of its breadth; thickness upwards of two-fifths.

Figs. 10 and 11, pl. XXI, external and internal view of the teeth.

This shell is easily distinguished by its more regularly oval form, and smaller size, seldom exceeding an inch and a quarter in length.

Found in the river Kennet, above Newbury.

GENUS III.—ALASMODON.—Say.

Shell thick, generally transversely elongate, but variable in form, equivalve, inequilateral; a little gaping posteriorly; with or without auricles; umbones for the most part rough, and decorticated, more so anteriorly; hinge with a lamellar, blunted, lateral tooth on the posterior side, situate under the ligament, but destitute of one on the anterior side; a short, irregularly indented, cardinal tooth in the right valve, which locks between the two irregularly crested teeth in the left valve; ligament exterior, and much elongated; muscular impressions large, irregular, frequently double, and placed near the extremities; pallial impression deeply defined.

1. *ALASMODON MARGARATIFERUS*, pl. XXII, f. 1, 2, 3, and pl. XXI, f. 13.

Variety 1. Ordinary form, pl. XXII, f. 1.

Alasmodon margaritiferum, Fleming, Brit. An., p. 417; *Unio margaritiferus*, Nilsson, p. 106, No. 2; Turton, Conch. Dict., p. 202, pl. 16, f. 1; Ib., Mau., p. 19, pl. 2, f. 9; Ib., Brit. Biv., p. 242, pl. 16, f. 1; Rossmassler, I, p. 120, pl. 4, f. 72, 73; Thompson, Ann. and Mag. Nat. Hist., VI, p. 55; *Unio mar-*

garitifera, Draperaud, p. 132, pl. 10, f. 17, 18, 19; Pfeiffer, I, p. 116, pl. 5, f. 11; *Unio elongata*, Lamarck, An. San. Vert., VI, pt. 1st, p. 70; *Damaris margaritifera*, Leach, MSS., p. 10; *Mya margaritifera*, Müller, Verm., II, p. 210, No. 396; Montagu, Test. Brit., p. 33; Donovan, Brit. Sh., pl. 73; Pennant, Brit. Zool., IV, p. 80, pl. 43, f. 18; Brown, Wernerian Mem., II, p. 505; Ib., Ency. Brit., 1st Ed., VI, p. 405; Ib., Ency. Edinensis, II, p. 542; *Alasmodon margaritiferus*, Brown, Illust. Conch., p. 83, pl. 31, f. 1, 2, pl. 32, f. 13, 14, 15, and pl. 30,* f. 1, 2, 3, 4.

Shell transverse, oblong-ovate; hinge line considerably arcuated; basal line concave; umbones flat, rugged, much decoraticated, and frequently with small, round perforations; an obsolete, gradually widening hollow, extends from the umbones to the base, in both valves; anterior side very short, and rounded; posterior side much elongated, and pointed; surface covered with a brownish-black, strong epidermis; teeth of the hinge strong, thick, subconic; right valve with a single tooth, notched on both sides, which locks into a bifurcated, notched tooth in the opposite valve; muscular impressions near both extremities, and are deep and complicated; pallial impression very distinctly defined, and deeply marked towards the anterior side; interior pearlaceous, with irregular streaks of green, and frequently bronzed; towards the centre are from twenty to thirty irregular, rather deep, nearly round punctures, of the size of the head of a small pin. Length upwards of two inches and a half; breadth five inches and a half.

Fig. 13, pl. XXI, external view of the teeth.

Found in the rivers Aun and Avon, Devonshire; the Conway; the Irt, Cumberland; the Lune, Lancashire; the Tay and Forth, in Scotland; the Tyrone, Bann, and Slaney, near Enniscorthy, some of the tributary streams of Lough Neagh, Ireland; and various other localities in Britain and Ireland.

This shell is familiarly known by the name of the Pearl Muscle. In a Paper on Pearls in the Philosophical Transactions, it is mentioned that several pearls of considerable value have been procured from the *Alasmodon margaritiferus*, which had been found in the rivers Tyrone and Donegal, Ireland. One of them weighed thirty-six carats, and would have been worth £40., but owing to its being impure, it lost

much of its value. Other pearls, from the same places, have sold for from £4. 10s. to £10. One at the last named price was bought by Lady Glenlealy, who had it placed in a necklace, and refused £80. offered for it by the Duchess of Ormond. We are told by Camden, that Sir John Hawkins had a patent for fishing pearls in the river Irt, Cumberland. There was also a great fishery for pearls in the river Tay, Scotland, which extended from Perth to Loch Tay; and, it is said, the pearls sent from thence to London, from the year 1761 to 1764, were worth £10,000. sterling. It is not uncommon at the present time to find pearls in the Teith and Tay, worth from £1. to £2. each.

Variety 2. ROISSYI, pl. XXII, f. 2, 3, and pl. XXI, f. 12.

Unio Roissyi, Michaud, Compl., p. 112, pl. 16, f. 28; Proceedings Brit. Assoc. for 1838; *Unio margaritifer*, Ross-massler, I, pl. 4, f. 74; Forbes, Mal. Mon., p. 44; Fleming, p. 417; Thompson, Ann. and Mag. Nat. Hist., VI, p. 56; *Alasmodon Roissyi*, Brown, Illust. Conch., p. 83, pl. 32, f. 13, 14, 15, and pl. 30,* f. 4.

This variety differs from the common form in the following particulars. The shell is much longer, in proportion to its breadth; it is more uniformly ovate, the teeth somewhat more elevated; the exterior covered with very fine, transverse striae, the epidermis blacker, and general surface more smooth; the hinge and basal lines less arcuated, interior more of a reddish-blush, or flesh-colour, and the shell considerably thinner than in the ordinary form; the muscular impressions are smaller, and less deep; the punctures are situate nearer the umbones, are elongated, and not deeply sunk, being more lacrymose in their appearance.

Fig. 12, pl. XXI, external view of the teeth.

This form inhabits the Teith, at Callander, Perthshire. Forbes has found this elegant variety in the Black river, near Kirk Bradden Church, and at Castleton, Isle of Man, where it is common. He says "it was formerly much sought after by the inhabitants for the sake of the pearls, which it not unfrequently contains." Mr. Thompson, on whose authority we give this variety, says it is common to several localities in Ireland, but does not particularize any of them. In the Teith, this form attains a much larger size than in the Isle of Man.

Variety 3. MINOR, pl. XXIII, f. 2.

Unio margaritifera, minor, Rossmassler, II, p. 21, pl. 9, f. 129; Nat Michaud; *Alasmodon minor*, Brown, Illust. Conch., p. 83, pl. 30,* f. 2.

Shell small, subcompressed; valves very thick; the cardinal teeth compressed, and small; general form like variety 1. Seldom exceeding an inch and a half in length; and three inches and a half in breadth.

Inhabits the Mint, near Kendal.

Rossmassler is wrong in supposing that this variety belongs to the form *Roissyi*.

I am indebted to the kindness of Miss Ellen T. Thomson, of Stricklandgate, and Thomas Gough, Esq., surgeon, Kendal, for specimens and a knowledge of this variety.

Variety 4. ARCUATA, pl. XXIII, f. 3.

Alasmodon arcuata, Brown, Illust. Conch., p. 84, pl. 30,* f. 3.

Shell small, subdepressed, thick; hinge line considerably arcuated; ligament prominent; basal line greatly curved; cardinal tooth in one valve very large; lateral sinus arcuated, and broad as it retires from the cardinal tooth; muscular impressions deep.

Found in the river Derwent, Bassenthwaite, Cumberland, a little way below Ouse Bridge.

Variety 5. OLIVACEA, pl. XXIII, f. 1.

Alasmodon olivacea, Brown, Illust. Conch., p. 84, pl. 30,* f. 1.

Small; substance of the shell thick, rather inflated; hinge line nearly parallel; basal line with a flexure, and a very little arcuated; valves with a slightly hollowed, longitudinal, gradually widening furrow, from the umbones to the basal margin; outer surface olivaceous, with irregular, transverse furrows; umbones much decorticated, which extends nearly to the dorsal extremity of the valves; inside of a dull flesh-colour, slightly nacreous towards the dorsal side; teeth small, distinctly tripartite in the left valve, and very small and single in the other.

This very curious variety was discovered by Thomas Glover, Esq., of Smedley Hill, in the Leven, a little way below the lake of Windermere, Westmoreland, where it appears to be the prevailing form.

FAMILY II.—CONCHACEA.

With at least three primary teeth in one valve, and the same number for the most part in the other; in a few instances less.

SUB-DIVISION.—FLUVIATILE.

Shells covered with a spurious epidermis, and the hinge provided with lateral teeth.

GENUS IV.—CYCLAS.—Lamarck.

Shell thin, equivalve, subequilateral, ventricose, transverse, or semiorbicircular; closed all round; beaks mostly tumid; cardinal teeth very small, sometimes hardly perceptible; with one plicated or lobed tooth in the left valve, and two divergent in the other; lateral teeth transversely elongated, acute, compressed, or lamelliform, double in the left valve; clothed with a thin, horny epidermis; two lateral, ovate, muscular impressions; pallial impression entire, destitute of a sinus; ligament external.

I. CYCLAS RIVICOLA, pl. XXII, f. 1, 2, 3.

Cyclas rivicola, Lamarck, V, p. 558; *Cyclas cornea*, Pfeiffer, Land un Was. Sc., p. 121, pl. 5, f. 3, 4, 5; Turton, Brit. Biv., p. 248, pl. 11, f. 13; Ib., Man., p. 12, f. 1; Fleming, Brit. An., p. 453; Alder, Mag. Zool. and Bot., II, p. 118; Brown, Illust. Conch., p. 93, pl. 39, f. 16, 17, 18; Ib., First Ed., pl. 17, f. 12; *Cyclas cornea*, Drapernaud, Hist. des Moll., p. 128, pl. 12, f. 1, 2, 3; *Tellina cornea*, Wood, pl. 46, f. 3; *Cardium corneum*, Montagu, p. 86.

Shell thin, pellucid, convex, ovate; covered by a horny-green epidermis, frequently marked with paler transverse zones; furnished with strong, close, regular, concentric striae; umbones obtuse, central, and slightly turned to one side; hinge with a very small cardinal tooth in the left valve, which fits into the space between two small, but rather produced teeth in the opposite valve; both valves provided with prominent, lateral, laminated teeth on each side, those of the right valve hardly rising above the margins, but in the left valve projecting considerably beyond them; inside smooth, bluish-white, dull in the concave disk, but glossy towards the

margin; an indistinct, pretty large, muscular impression near the anterior margins, and a narrower, obscure one in the posterior sides.

This is the largest species of the genus, sometimes measuring five-eighths of an inch in length, and seven-eighths in breadth.

Found plentifully in the Thames at Battersea, and also near Red House, and in the neighbourhood of Oxford; of a large size in the Trent, near Burton; and in many slow rivers in England.

2. CYCLAS CORNEA, pl. XXIII, f. 4.

Cyclas cornea, Pfeiffer, p. 120, pl. 5, f. 1, 2; Turton, Brit. Biv., p. 248, pl. 11, f. 14; Ib., Man., p. 13, f. 2; Fleming, Brit. An., p. 452; Forbes, p. 49; Thompson, Ann. and Mag. Nat. Hist., VI, p. 52; Alder, Mag. Zool. and Bot., II, p. 118; Brown, Illust. Conch., p. 93, pl. 39, f. 19; Ib., First Ed., pl. 17, f. 15; *Cyclas rivalis*, Draperaud, Hist. des Moll., II, p. 202, No. 387; *Tellina cornea*, Gmelin's Linné, I, p. 1120, No. 72.

Shell subglobular, ventricose, thin, semitransparent; with concentric, nearly obsolete striae; umbones obtuse; epidermis greenish horn-colour, with darker zones, and bordered with a broad, yellowish band; inside dull bluish-white. Length three and a half eighths of an inch; breadth half an inch.

A very distinct variety, considerably less than the ordinary size, with the teeth larger in proportion, and of a lemon-yellow colour, was found by Mr. Glover, in the Leven, not far from Ambleside.

Found in most water streams, and in stagnant ditches and pools, throughout Britain and Ireland; is common in Duddingston Loch, near Edinburgh, of the size above described, which is considerably more than its ordinary dimensions.

This shell is readily distinguished from the *C. rivicola*, by its more ventricose shape, in being thinner, more transparent, and seldom measuring above half the size of the former.

3. CYCLAS LACUSTRIS, pl. XXIII, f. 5.

Cyclas lacustris, Draperaud, Hist. des Moll., p. 130, pl. 10, f. 6, 7; Lamarck, V, p. 559, No. 3; Turton, Man., p. 14, f. 4; Pfeiffer, p. 122, pl. 5, f. 6, 7; Fleming, Brit. An., p. 453; Thompson, Ann. and Mag. Nat. Hist., VI, p. 52; Brown, Illust. Conch., p. 94, pl. 39, f. 20; Ib., First Ed., pl. 17, f. 16.

Shell thin, rhombic-orbicular, subequilateral, somewhat compressed; sides rather obtuse, rendering the general contour more circular than others of the genus; obsoletely striate; beaks obtuse, of a grayish ash-colour.

It is much more compressed than any of the other British Cyclydae.

Found in Ulliswater; a small pond on the grounds at Corby, Cumberland; and at Prestwick Car, Northumberland. It is a rare British shell. Thompson says it is rare in Ireland, but has been met with at Tallaght, by Mr. Ball, and in the pond, Phoenix Park, by Mr. Warren.

4. CYCLAS CALYCULATA, pl. XXIII, f. 6.

Cyclas calyculata, Drapernaud, Hist. des Moll., p. 130, pl. 10, f. 14, 15; Lamarck, V, p. 559, No. 5; Pfeiffer, p. 122, pl. 5, f. 17, 18; Turton, Man., p. 14, f. 3; Forbes, p. 50; Brown, Illust. Conch., p. 94, pl. 39, f. 21; Ib., First Ed., pl. 17, f. 13; *Cyclas lacustris*, Alder, Mag. Zool. and Bot., II, p. 118.

Shell thin, rhombic-orbicular, grayish ash-coloured, compressed, diaphanous, substriate, or nearly smooth; slightly angular on one side; umbones very prominent, and acute. About a quarter of an inch long; and its width nearly the same.

Found in the lakes of Westmoreland, and is not uncommon in several pits and ponds near Manchester, but is a very rare and local species.

GENUS V.—PISIDIUM.—Pfeiffer.

Shell equivalve, transverse; sides unequal, completely closing; in the right valve one, and in the left valve two opposite, very small, primary teeth; behind and before, two thin, lamellar, side teeth; those of the latter cleft in the right valve, in order to receive the opposite ones.

The shells of this genus are distinguished from those of *Cyclas*, by being less equilateral in their form, and in the ligamentary side being shortest, which is the reverse in *Cyclas*.

1. PISIDIUM OBLIQUUM, pl. XXIII, f. 7.

Pisidium obliquum, Pfeiffer, p. 124, pl. 5, f. 19, 20; Brown, Illust. Conch., p. 94, pl. 39, f. 22; Ib., First Ed., pl. 17, f. 14; *Cyclas obliqua*, Lamarck, V, p. 559, No. 4; *Cyclas palustris*, Drapernaud, Hist. des Moll., p. 131, pl. 10, f. 17, 18; *Cyclas*

amnica, Turton, Brit. Biv., p. 250, pl. 11, f. 15; Ib., Man., p. 15, f. 5; *Cyclas amnicus*, Fleming, Brit. An., p. 453; *Tellina amnica*, Gmelin's Linné, I, p. 3242, No. 78; Müller, p. 205, No. 389; *Tellina rivalis*, Linn. Trans., IV, p. 187; Donovan, Brit. Sh., II, pl. 64, f. 2; *Cardium amnicum*, Montagu, p. 86; *Pisidium amnicum*, Thompson, Ann. and Mag. Nat. Hist., VI, p. 54.

Shell thin, subpellucid, of a brownish or grayish horn-colour, obliquely oval, moderately convex, and sulcated concentrically, with the furrows finely striated; beaks tumid, a little produced, and placed considerably towards the anterior side; left valve provided with a double central tooth, and two lateral teeth on each side, standing parallel one within the other, the outer of which is very small; right valve with two cardinal, approximating, oblique teeth, with one lateral tooth on each side, that on the posterior side strong, and elevated above the margin of the shell; inside bluish-white, dim in the disk, but glossy towards the margin; on each side are distinctly visible, large, smooth spaces, to which the muscles adhere. Length three-eighths of an inch; breadth half an inch: although it is but rarely met with of this size.

Found in slow running rivers and streams, and is known to inhabit the Avon, Wiltshire; in the water-courses in the meadows near Wareham, Dorsetshire; the Liffey, Ireland, near Sallins, Kildare, and in rivulets which run through the bog at that place; in a stream near Clonooney, Kings County; we have also met with it in a stream, which empties itself into the Water of Leith, a little way above Colt Bridge, near Edinburgh; and many other localities.

2. *PISIDIUM FONTINALE*, pl. XXIII, f. 8.

Pisidium fontinale, Pfeiffer, Land un Was. Sn., p. 126, pl. 5, f. 15, 16; Brown, Edin. Journ. Nat. and Geo. Science, I, p. 11 and 413, pl. 1, f. 5, 6, 7; *Cyclas fontinalis*, Drapernaud, Hist. des Moll., p. 130, pl. 10, f. 11, 12; Lamarck, An. San. Vert., V, p. 559, No. 7; *Cyclas pusilla*, Turton, Conch. Dict.; Ib., Brit. Biv., p. 251, pl. 11, f. 16, 17; Ib., Man., p. 16, f. 7; *Pisidium pulchellum*, Jenyns, Monog., p. 18, pl. 21, f. 1; Thompson, Ann. and Mag. Nat. Hist., VI, p. 53; Forbes, Mal. Mon., p. 50; *Pisidium fontinale*, Brown, Illust. Conch., p. 94, pl. 39, f. 23.

Shell suboval, oblique, very convex, pellucid, and covered with extremely fine, concentric, rather obscure striæ; umbones obtuse, placed nearest the anterior side; hinge with one central and two lateral teeth in the right valve, and two oblique cardinal and one lateral tooth in the other; colour pale ash. A little more than an eighth of an inch in length; and somewhat more in breadth.

First discovered in a ditch at Duddingston Loch, near Edinburgh, by my friend James Gerard, Esq. I have since found it in the ditch at the north end of the Loch, and also in a ditch at Hunter's Bog, King's Park. Thompson says it inhabits the north and south of Ireland.

Turton, in his Manuel, says it is found "in most streams and brooks," but although I have examined numerous localities in England, Ireland, and Scotland, I have not found it so common as he alleges.

3. *PISIDIUM OBTUSALE*, pl. XXIII, f. 9.

Pisidium obtusale, Alder, Mag. Zool. and Bot., II, p. 118; Pfeiffer, p. 125, pl. 5, f. 21, 22; Brown, Edin. Journ. Nat. and Geo. Science, I, p. 413; Ib., Illust. Conch., p. 94, pl. 39, f. 24; Thompson, Ann. and Mag. Nat. Hist., VI, p. 53; *Cyclas obtusalis*, Lamarck, V, p. 559, No. 6; *Pera gibba*, Leach, MSS.

Shell oblique, ventricose, heart-shaped; sides somewhat unequal; beaks prominent, and obtusely rounded; pellucid, yellowish-white, or pale horn-coloured; with extremely minute, concentric, thin striæ; the lower edges of the valves rather sharp. Length an eighth of an inch; breadth an eighth and a quarter; thickness not quite an eighth.

I found this new British species plentiful in a ditch at the Wells of Weary, immediately under the columnar greenstone rocks, west end of Arthur's Seat, near Edinburgh, which is now covered up by the railway. Thompson gives as localities in the north of Ireland, a drain near Bangor, and a pond at Portavo; and at Finnoe, Tipperary, in the south.

4. *PISIDIUM APPENDICULATA*, pl. XXIII, f. 10.

Pisidium appendiculata, Brown, Illust. Conch., p. 95, pl. 39, f. 25; *Cyclas appendiculata*, Leach, MSS.; Turton, Man., p. 15, f. 6; *Pisidium Henslowianum*, Thompson, Ann. and Mag. Nat. Hist., VI, p. 54; *Tellina Henslowinana*, Sheppard, Linn. Trans., XIV, p. 150.

Shell obliquely oval, much inflated; with regular, well defined, concentric grooves; beaks very tumid, considerably produced, and somewhat tubercled. Length an eighth and a half of an inch; breadth not quite a quarter.

Found in slow running streams, but is very rare. Thompson says it is met with at Finnoe, Tipperary, Ireland.

This shell seems nearly allied to *P. obliquum*, from which, however, it differs, in its greater convexity, and the protrusion of the beaks, at the base of which is a groove, or dark zone, giving them the appearance of tubercular appendages.

5. *PISIDIUM NITIDUM*, pl. XXIII, f. 11.

Pisidium nitidum, Jenyns, Monog., p. 16, pl. 20, f. 7, 8; Thompson, Ann. and Mag. Nat. Hist., VI, p. 53; Brown, Illust. Conch., p. 95, pl. 39, f. 26.

Shell suborbicular, or slightly oval; umbones large, and blunt; external surface very glossy, of a pale horn-colour, and covered with fine, concentric striae, which are wider-set and deeper on the umbones.

Inhabits Battersea Fields, some ditches in Cambridgeshire, and ditches near Worcester; in a pond at Wolfhill, near Belfast, and other places in that neighbourhood; Lough Gill, County Sligo, Portarlington, and Finnoe, Ireland.

6. *PISIDIUM PUSILLUM*, pl. XXIII, f. 12.

Pisidium pusillum, Jenyns, Monag., p. 14, pl. 20, f. 4 and 6; Thompson, Ann. and Mag. Nat. Hist., VI, p. 53; Brown, Illust. Conch., p. 95, pl. 38, f. 27; *Cyclas pusilla*, Turton, Brit. Biv., p. 251, pl. 11, f. 16, 17; Ib., Man., p. 16, pl. 1, f. 7; Alder, Mag. Zool. and Bot., II, p. 119.

Shell nearly orbicular, slightly ovate, subcompressed; umbones prominent, and very obtuse at the points; sides somewhat flattened, and very slightly inequilateral; surface of an olivaceous-brown, with very fine, concentric striae.

Inhabits ponds near London, and many other localities. In Ireland, according to Thompson, it is the most common of the genus, frequenting ponds and drains.

7. *PISIDIUM CINEREUM*, pl. XXIII, f. 13.

Pisidium cinereum, Alder, Cat. Sup., p. 4; Ib., Mag. Zool. and Bot., II, p. 119; Thompson, Ann. and Mag. Nat. Hist., VI, p. 54; Brown, Illust. Conch., p. 95, pl. 39, f. 28.

Shell compressed, subovate; umbones but slightly produced, obtuse at the points, where it is sometimes capped; lower margins of the valves meeting at an acute angle; surface of a grayish ash-colour, and finely striated concentrically; with a few deeper sulci, which form deeper transverse zones.

This shell is more ovate in its form than any of its congeners, excepting the *Pisidium obliquum*, and will be at once recognized by being more compressed than any of them, and by its ashy hue.

Variety 1. *Somewhat more ventricose, with the umbones a little more produced.*

Inhabits ponds near Newcastle, and other localities in the North of England. Mr. Thompson says it is widely spread throughout Ireland, although no where common. He particularizes Holywood House, Downshire; Youngrove, near Middleton, County of Cork, by Miss M. Ball; Killereran, County of Galway, and Portarlington, by the Rev. B. J. Clarke; and neighbourhood of Dublin, by Thomas William Warren, Esq.

8. PISIDIUM JOANNIS.

Pisidium Joannis, Macgillivray, Moll. Ab., p. 248; Brown, Illust. Conch., p. 132.

Shell transversely-ovate, moderately convex, thin, glossy; both sides well rounded; umbones tumid, obtuse, with smooth beaks, and placed nearest the anterior side; whole surface with numerous, concentric striæ, the intervening furrows broader, smooth, and glabrous, with several well marked lines of growth; hinge line a little arcuated; colour greyish-yellow. Length two-twelfths of an inch; breadth two and a half twelfths.

Found by Mr. Leslie, in a ditch and pond of the Professor of Medicine, and afterwards by Professor Macgillivray, in a ditch near the Links of Old Aberdeen, where it is very abundant.

9. PISIDIUM JENYNSSII.

Pisidium Jenynsii, Macgillivray, Moll. Ab., p. 249; *Pisidium pulchellum*, var., Jenyns; Brown, Illust. Conch., p. 132.

Shell transversely and obliquely ovate, somewhat tumid, very thin, and glossy; with regular, distinct, concentric striæ, a few more conspicuous lines of growth, and very faint radiating

striulae; umbones tumid, obtuse, considerably nearer the anterior side, which forms about a third of the segment of a circle, its slope being convex, and about a third shorter than the posterior side; colour cream-white. Breadth nearly two-twelfths of an inch; length not quite a twelfth.

Found among the roots of aquatic plants, in a ditch between Aberdeen and Spital.

APPENDIX.

C L A S S M O L L U S C A.

GENUS I.—NERITINA.

NERITINA FLUVIATILIS, pl. XXIV, f. 16.

Animal with the sides of the body simple, destitute of elongated filaments; tentacles subulate, with the eyes placed on short pedicles at the exterior side of their base.

GENUS II.—PALUDINA.

PALUDINA VIVIPARA, pl. XXIV, f. 19, 20, 21.

Animal with elongated tentacles, and eyes situated at the exterior side of their base; branchiae always placed in the gill receptacle.—Eggs of *P. impura*, f. 35, 40.

GENUS III.—ASSIMINIA.

ASSIMINIA GRAYANA, pl. XXIV, f. 17.

Animal with very short tentacles, hardly longer than the tubercles on which they are seated, and united to their side.

GENUS IV.—VALVATA.

VALVATA PISCINALIS, pl. XXIV, f. 18.

Animal with elongated, tapering, and somewhat obtuse tentacles, with the eyes situate on small tubercles at the posterior side of their base; mouth a little boscidiform; foot truncated,

and slightly lobed in front, rounded, and with a small fissure behind; branchiæ formed of an elongate, tapering, conical process, provided on each side with a series of spirally twisted laminæ, placed opposite each other; on the posterior portion of the right side is a produced branchial filament.—Eggs of *V. cristata*, f. 38; eggs of *V. obtusa*, f. 55.

GENUS V.—LYMNÆA.

LYMNÆA STAGNALIS, pl. XXIV, f. 44.

Animal with a short, broad foot; tentacles short, broad, and compressed, eyes situate near the outer side of their base, destitute of auricles at their base; body large, central, and spiral; mantle with a simple margin.—Eggs of *L. ovata*, f. 31, 32; eggs of *L. peregra*, f. 41, 42, 43.

GENUS VI.—AMPHIPEPLEA.

Animal closely resembling that of the genus *Lymnæa*, but having a lobed produced edge to its mantle, so as to cover the shell.

GENUS VII.—PHYSA.

PHYSA HYPNORUM, pl. XXIV, f. 27.

Animal with the foot elongated, with the spiral body placed in its centre; mantle large, with a lobed margin, expanded over the shell.—Eggs of *P. fontinalis*, f. 33.

GENUS VIII.—PLANORBIS.

PLANORBIS CORNEUS, pl. XXIV, f. 26.

Animal with a small foot; body long, slender, and subcentral; tentacles with an auricle at the base; neck with three orifices on its left side.—Eggs of *P. cornutus*, f. 34; eggs of *P. contortus*, f. 29, 30.

GENUS X.—CYCLOSTOMA.

CYCLOSTOMA ELEGANS, pl. XXIV, f. 24.

Animal with the foot broad, formed of two longitudinal portions; body central and spiral, enveloped in a mantle, with a simple margin.

The animal progresses by alternately advancing one side of the foot, while the other is adherent.

GENUS XII.—ACME.

Animal with a spiral body, placed in the centre of the foot, which is elongated, and covered by a thin mantle with a thickened margin; tentacles two, long and slender, with eyes situate near the inner side of their base.

GENUS XIII.—SUCCINEA.

SUCCINEA AMPHIBIA, pl. XXIV, f. 22.

Animal with a large gelatinous foot, with four short ventricose tentacles; body oblong, spiral, placed diagonally on the superior portion of the foot.—Eggs of *S. amphibia*, f. 36, 37.

GENUS XIV.—ACHATINA.

Animal with an elongated foot, on which is placed a long, slender, spiral, central body; tentacles four, the upper ones subulate, obtuse, and eyeless.

GENUS XV.—BULIMUS.

Animal with an elongated foot; body central, long, and slender; tentacles four.

GENUS XVI.—BALÆA.

Animal like Bulimus, but is heteroclitical, or reversed.

GENUS XVII.—CLAUSILIA.

CLAUSILIA BIDENS, pl. XXIV, f. 28.

Animal like Bulimus, but reversed, or heteroclitical.

GENUS XVIII.—PUPA.

Animal like Bulimus, with four claviform tentacles, the lower pair short, and small.

GENUS XIX.—VERTIGO.

VERTIGO SEXDENTULA, pl. XXIV, f. 23.

Animal like Bulimus, with only two elongate, claviform tentacles, the lower pair being either wanting or only rudimentary.

GENUS XX.—AZECA.

Animal like Bulimus, the upper tentacles claviform.

GENUS XXI.—HELIX.

Section 1.—Mantle thin, never protruding beyond the shell; body granular, and destitute of grooves; lips short, and rounded.

HELIX ASPERSA, pl. XXV, f. 5, and *H. NEMORALIS*, f. 2.

Animal with an elongated, depressed foot; body large, and central; head and eyes retractile, within the skin, which envelopes them as a sheath.—Eggs of *H. pomatia*, f. 11; eggs of *H. nemoralis*, f. 9.

Section 2.—Neck granular.

HELIX LAPICIDA, pl. XXV, f. 4.

Section 3.—Foot short, and hyaline.

HELIX CELLARIA, pl. XXV, f. 3.

ORDER GASTEROPODA.

GENUS I.—VITRINA.

VITRINA PELLUCIDA, pl. XXV, f. 1.

Animal with an elongated, lanceolate body; mantle partly internal, and shield-shaped, rough in front.

GENUS II.—TESTACELLA.

Animal with an elongated body, narrowed in front, and provided with two divergent grooves, issuing from the fore part of the mantle, and terminating at the head; mantle small, covered with an auriform shell, situate on the hinder part of the body.

1. TESTACELLA HALIOTOIDEA, pl. XXVI, f. 1.

Testacellus Haliotoides, Féruccac, Hist. Moll., pl. 8, f. 5; *Testacella Haliotoidea*, Drapernaud, pl. 8, f. 44, 45; Thompson, Ann. and Mag. Zool. and Bot., VI, p. 19; Ib., Mag. Nat. Hist., VII, p. 226, f. 39; Brown, Illust. Conch., p. 131, pl. 59, f. 17.

Animal with cylindrical tentacles; grey, yellowish, or pale reddish; spotted on the sides beneath in some specimens; body elongate, tapering from the shield to the head.

Found in a garden, at Lambeth, by Mr. Sowerby.

GENUS IV.—LIMAX.—Féruccac.

Animal with an elongated, lanceolate, granular body, carinated behind; mantle shield-shaped, ovate, concentrically lineated, entirely enveloping the shell; end of the tail tapering, and destitute of a gland; pulmonary cavity situated in front of the body, respiratory orifice towards the hinder part of its edge, or behind the middle; infræsophageal ganglion provided with two fissures below, presenting on each side of the medial line three gangliform prominences.

The following is the arrangement of the Rev. B. J. Clarke.

Section I.—Mantle produced behind, concentrically striate; tail partially carinated.

1. LIMAX MAXIMUS, pl. XXVI, f. 10, 11.

Limax Maximus, Thompson, Ann. and Mag. Nat. Hist., VI, p. 18; Clarke, Ib., XII, p. 333, pl. 10, f. 1, 2; Brown, Illust. Conch., p. 131, pl. 58, f. 3; *Limax maculatus*, Müller, p. 8; Drapernaud, p. 124, pl. 7, f. 10.

Animal ash-coloured, spotted, or immaculate; tentacles venous-coloured; keel long, white, and acute; mantle with its hinder extremity produced, shield-shaped; skin with small, linear rugosities, converging towards the caudal extremity.

Variety 1. Drapernaud; pl. XXVI, f. 10. *Shield spotted; back with black, longitudinal, broad lineations.*

Variety 2, pl. XXVI, f. 11. *Ash-coloured and black.*

Cinereo-niger, Nilsson, p. 7.

2. LIMAX ARBOREUS, pl. XXVI, f. 2, 3, 4, 5, 6, 7.

Limax arboreus? M. Bouchard Chantreux, Cat. des Moll.

terres. et fluv. du Pas de Calais; Brown, Illust. Conch., p. 131, pl. 59, f. 9, 10, 11, 12, 13; *Limax glaucus*, Clarke, Ann. and Mag. Nat. Hist., XII, p. 334, pl. 11, f. 4 to 10.

Animal whitish-yellow, smooth, and variegated; shield with two black, dorsal bands; tentacles obscure.

Found on trees covered with moss; the Ash and Elm seem a favourite resort.

Section II.—Mantle rounded behind, and concentrically striate; end of the tail carinated.

3. LIMAX FLAVUS, pl. XXV, f. 21, 22.

Limax flavus, Drapernaud; Clarke, Ann. and Mag. Nat. Hist., XII, p. 338, pl. 11, f. 11, 12; Brown, Illust. Conch., p. 131, pl. 59, f. 7, 8; *Limax variegatus*, Féruccac.

Animal yellowish, spotted with brown; the tentacles azure-blue; mantle mottled with yellow; body more or less spotted with yellow, and the sides pale yellow.

Found in cellars and damp ground floors, and rarely upon trees.

Section III.—Mantle truncated behind, concentrically striate; end of tail carinated.

4. LIMAX AGRESTIS, pl. XXVI, f. 9.

Limax agrestis, Linn. Syst. Nat., II, p. 1082; Nunneley, Local Cat., pl. 1, f. 4; Thompson, Ann. and Mag. Nat. Hist., VI, p. 19; Clarke, Ib., XII, p. 338, pl. 12, f. 13; Brown, Illust. Conch., p. 131, pl. 59, f. 16.

Animal grey or reddish, frequently spotted with brown; body with interrupted furrows, and provided with a short, oblique carina; mantle large, ovate, rounded behind, and concentrically striate.

Inhabits fields and open situations.

Section IV.—Mantle truncated behind, granulated or shagreened; back carinated from the mantle to the extremity.

5. LIMAX SOWERBII, pl. XXV, f. 12, 13.

Limax Sowerbii, Féruccac, Hist. Moll., pl. 8 D, f. 7; Alder, Mag. Zool. and Bot., II, p. 105; Clarke, Ann. and Mag. Nat. Hist., XII, p. 338, pl. 12, f. 14, 15; Brown, Illust. Conch., p. 131, pl. 58, f. 6, and pl. 59, f. 14.

Animal pale yellow, tessellated with brown, head and tentacles black; mantle granulated, with a furrow near its margin; dorsal keel amber-coloured, and very conspicuous; sides cream-white.

Found in open situations.

6. *LIMAX GAGATES*, pl. XXV, f. 14, 15, 16, 17.

Limax gagates, Drapernaud, pl. 9, f. 1, 2; Clarke, Ann. and Mag. Nat. Hist., XII, p. 339, pl. 12, f. 16 to 22; Brown, Illust. Conch., p. 131, pl. 58, f. 4, 5, and pl. 59, f. 2, 3, 4, 5, 6.

Animal shining black; body with subrugose striæ, the back carinated; mantle truncated posteriorly, and granulated; circumscribed by an elevated ridge, which meets in a point near the pulmonary orifice, making the upper portion of the mantle appear more prominent than the rest; back abruptly carinated its whole length from the mantle; when at rest the keel projects above the mantle, and forms a carinated ridge.

Variety 1. Féruccac; pl. XXV, f. 18, 19, 20. *Lead-coloured or greyish-black.*

Variety 2. Clarke. *Brown; with the sides of the mantle yellowish.*

Found by the Rev. B. J. Clarke, at Tourmakady Lodge, on the borders of Lough Mash, Ireland.

7. *LIMAX ATER?* YOUNG, pl. XXVI, f. 13.

GENUS V.—ANCYCLUS.

ANCYCLUS FLUVIATILIS, pl. XXIV, f. 25.

Animal conical; body attached to the foot its whole length; tentacles triangular, compressed, with an auricle at their base.

CLASS CONCHIFERA.

ORDER MONOMYARIA.

GENUS I.—DREISSINA.

DREISSINA POLYMORPHA, pl. XXVII, f. 5, 6.

Animal with the mantle closed all round, with the exception of three apertures; the anterior one for the passage of the foot,

and two behind; the superior one round, that below syphon-shaped, with a large reflexed mouth; anterior end of the body cleft, and included between the segments of the anterior transverse muscle, which is attached to the front of the shell; abdomen depressed; foot conically-elongated, with a tuft of byssus at the base, and a distinct groove for its passage; posterior half of the gills free throughout.

Fig. 5, *a* the byssus, *b* the lower syphon, *c* the upper syphon.
Fig. 6, the lower syphon magnified.

ORDER DIMYAIRA.

GENUS I.—ANODON.

ANODON CYGNEA, var. **PISCINALIS**, pl. XXVII, f. 9, 10.

Animal with the lobes of the mantle free all round, except at the back; the posterior margin, when in conjunction, forming two apertures for the passage of the water, food, and rejectamenta. *a* the upper syphon, which is small and simple, *b* the lower one, which is provided with a serrated margin, consisting of several series of larger and smaller teeth, *c* the foot.

Fig. 10, the lower syphon magnified.

GENUS II.—UNIO.

UNIO PICTORUM, pl. XXVII, f. 7.

The animals of the genera *Unio* and *Alasmodon* are similar to that of *Anodon*. *a* the upper syphon, *b* the lower one, *c* the foot.

Fig. 8 is the spawn of *Unio pictorum*.

GENUS IV.—CYCLAS.

CYCLAS CORNEA, pl. XXVII, f. 3, 4.

Animal with the lobes of the mantle free beneath and anteriorly, united posteriorly, and extended into two syphons; foot compressed, and subquadrate, on becoming strap-shaped; provided with anterior and posterior nearly equal adductor muscles, for opening and closing the valves. *a* the upper syphon, *b* the lower one, *c* the foot.

Fig. 4 shews the situation of the young, before their extrusion from the parent shell. They are completely formed, and covered with a shell before their ejection.

GENUS V.—PISIDIUM.

PISIDIUM OBLIQUUM, pl. XXVII, f. 1, 2.

Animal similar to that of *Cyclas*, but with the mantle extended posteriorly into a short, simple, contractile siphon; foot tongue-shaped, and capable of much extension. *a* the siphon, *b* the foot.

Fig. 2 exhibits the situation occupied by the young before their extrusion from the parent shell; as they are viviparous as well as the young of *Cyclas*.

GENUS CYCLAS.—(Page 116.)

5. CYCLAS CITRINA, pl. XXIV, f. 15, 15.

Cyclas flavescens? Macgillivray, Moll. Ab., p. 246.

Shell very thin, subdiaphanous, and slightly elliptical; very ventricose, a little inequilateral, nearly hemispherical; umbones large, prominent, inflated, and rounded; covered with a rather dull citron-coloured epidermis, beneath which the surface is irregularly and strongly striated concentrically, with two or three lines of growth. Length about two and a half eighths of an inch.

This shell differs from *Cyclas cornea*, in being more orbicular, in the umbones being much larger, more prominent, and bulging, and it never attains so large a size as that species.

Discovered by Thomas Glover, Esq., of Smedley Hill, Manchester, in the Leven, a little way below the Lake of Windermere, Westmorland.

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THE FOLLOWING WORKS,

BY CAPTAIN THOMAS BROWN, M.W.S., M.P.S.,

MEMBER OF THE MANCHESTER GEOLOGICAL SOCIETY,

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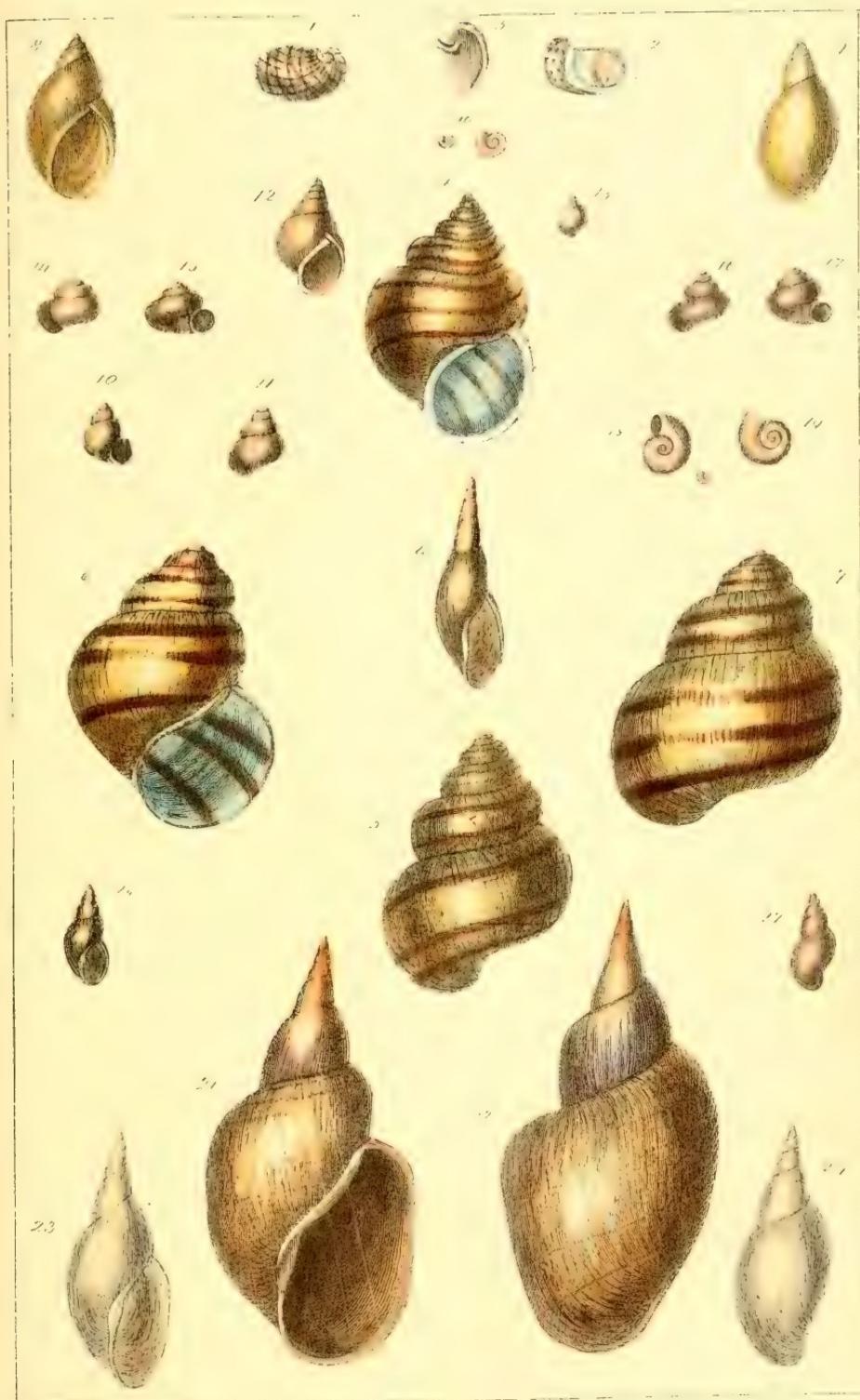
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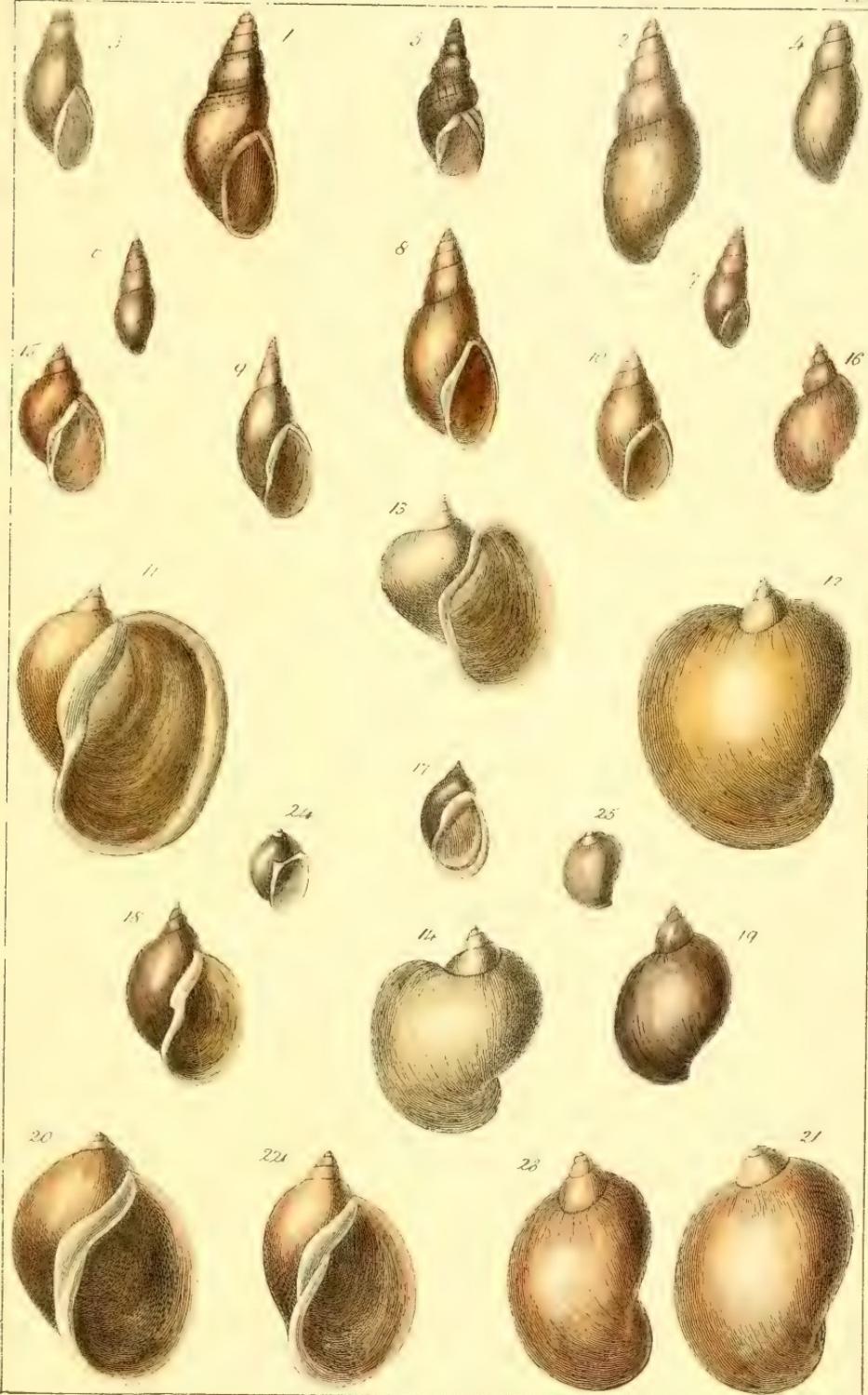
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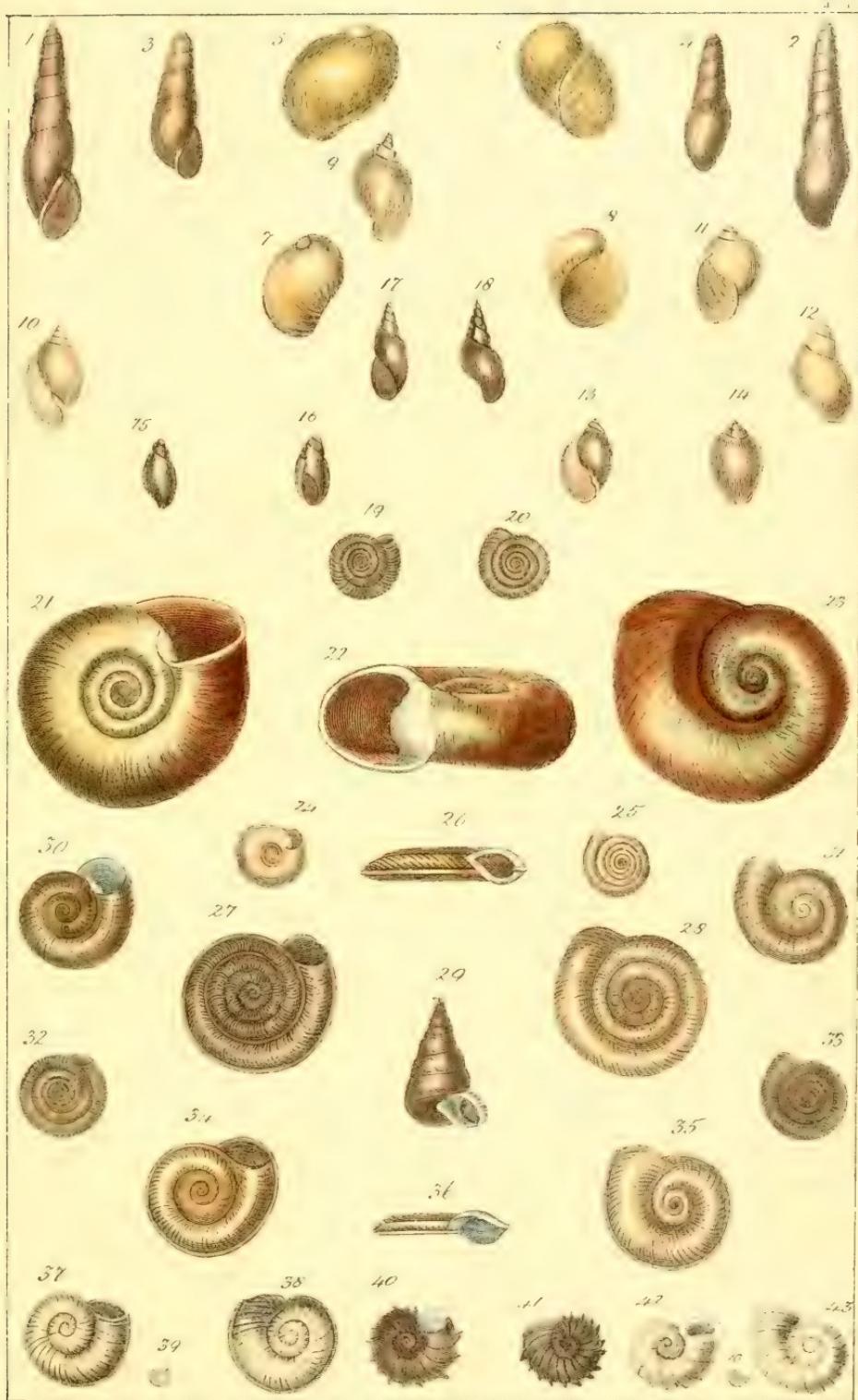
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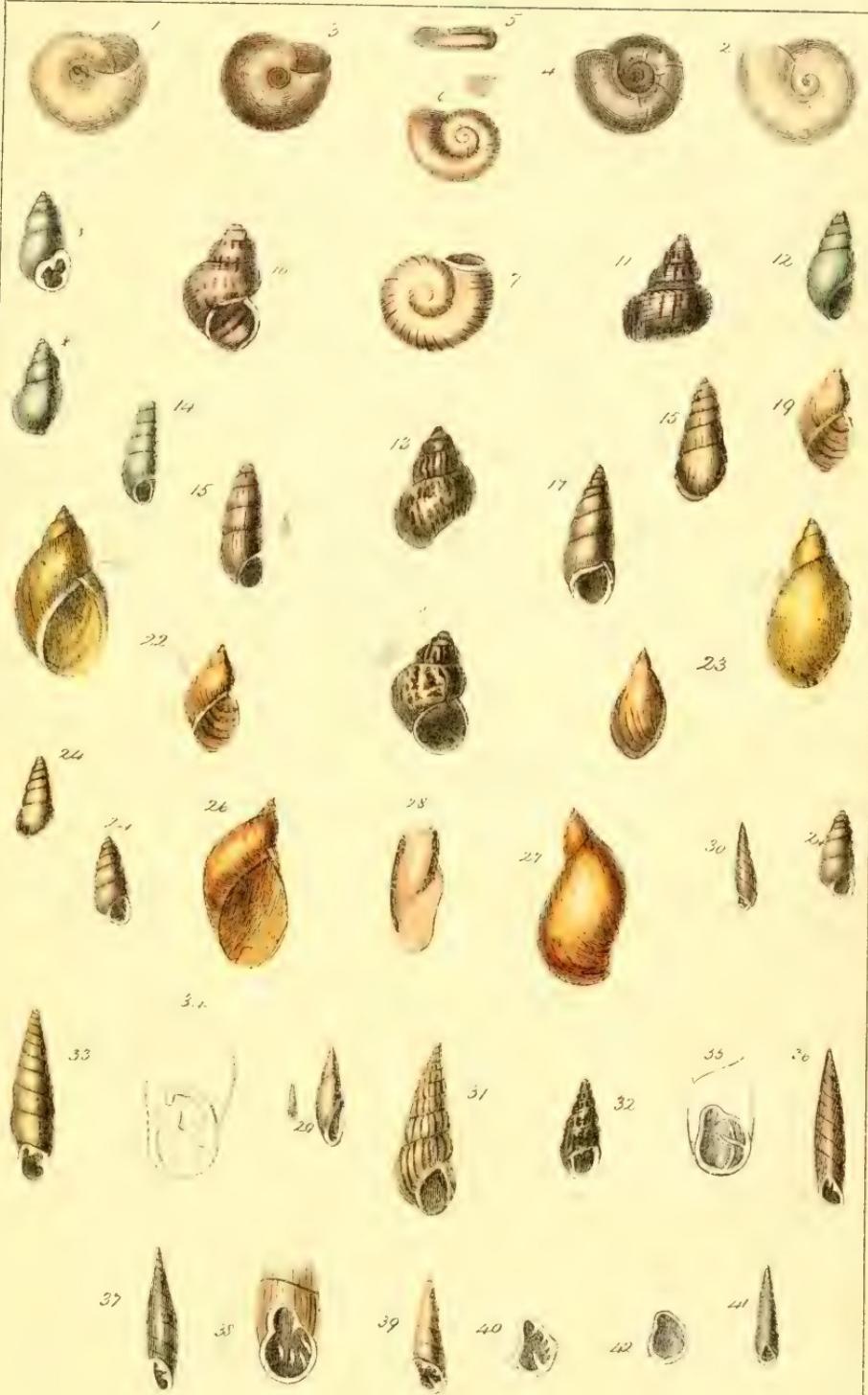
N.B.—Each Species has the Generic name prefixed in full.

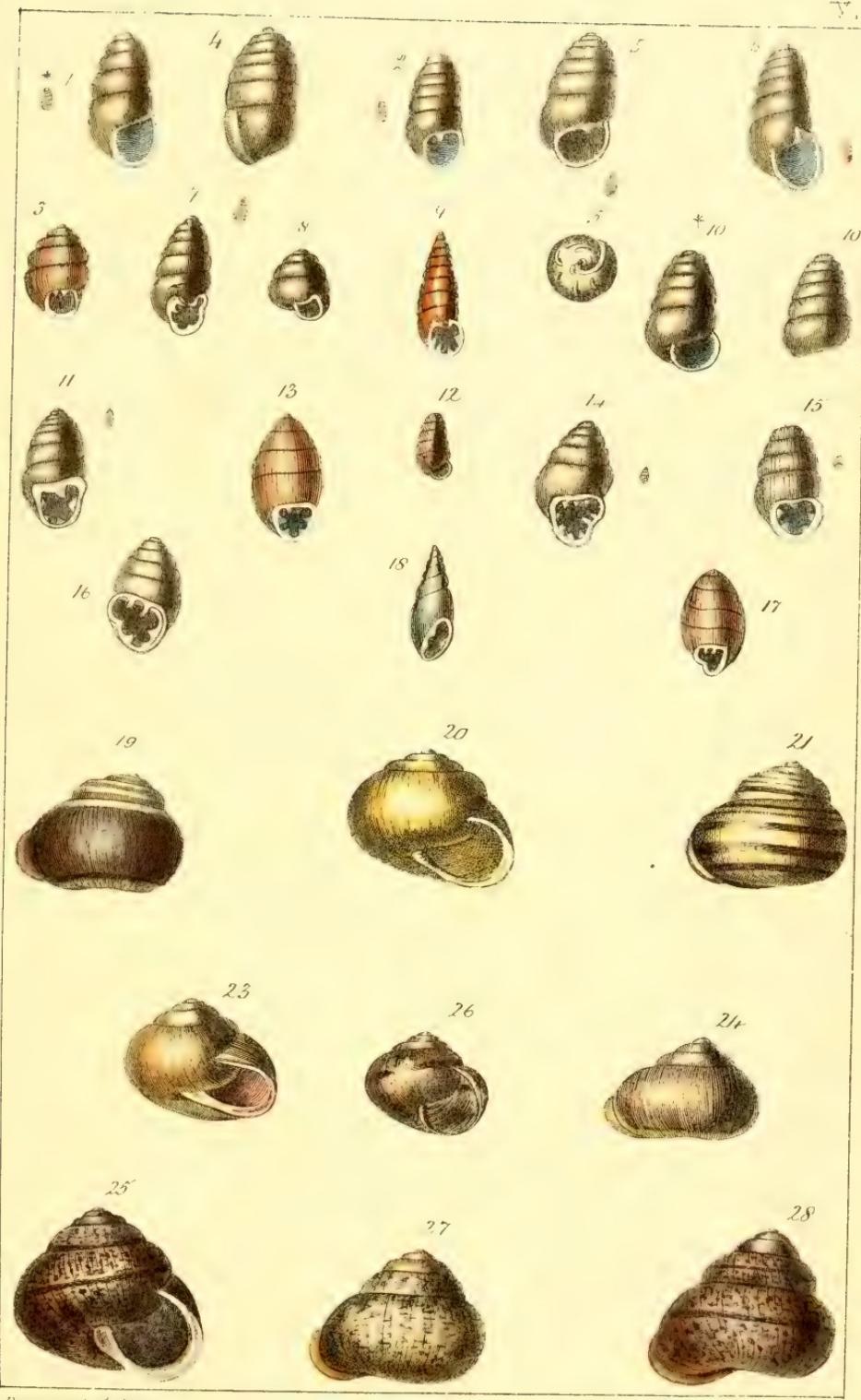
PINIS.





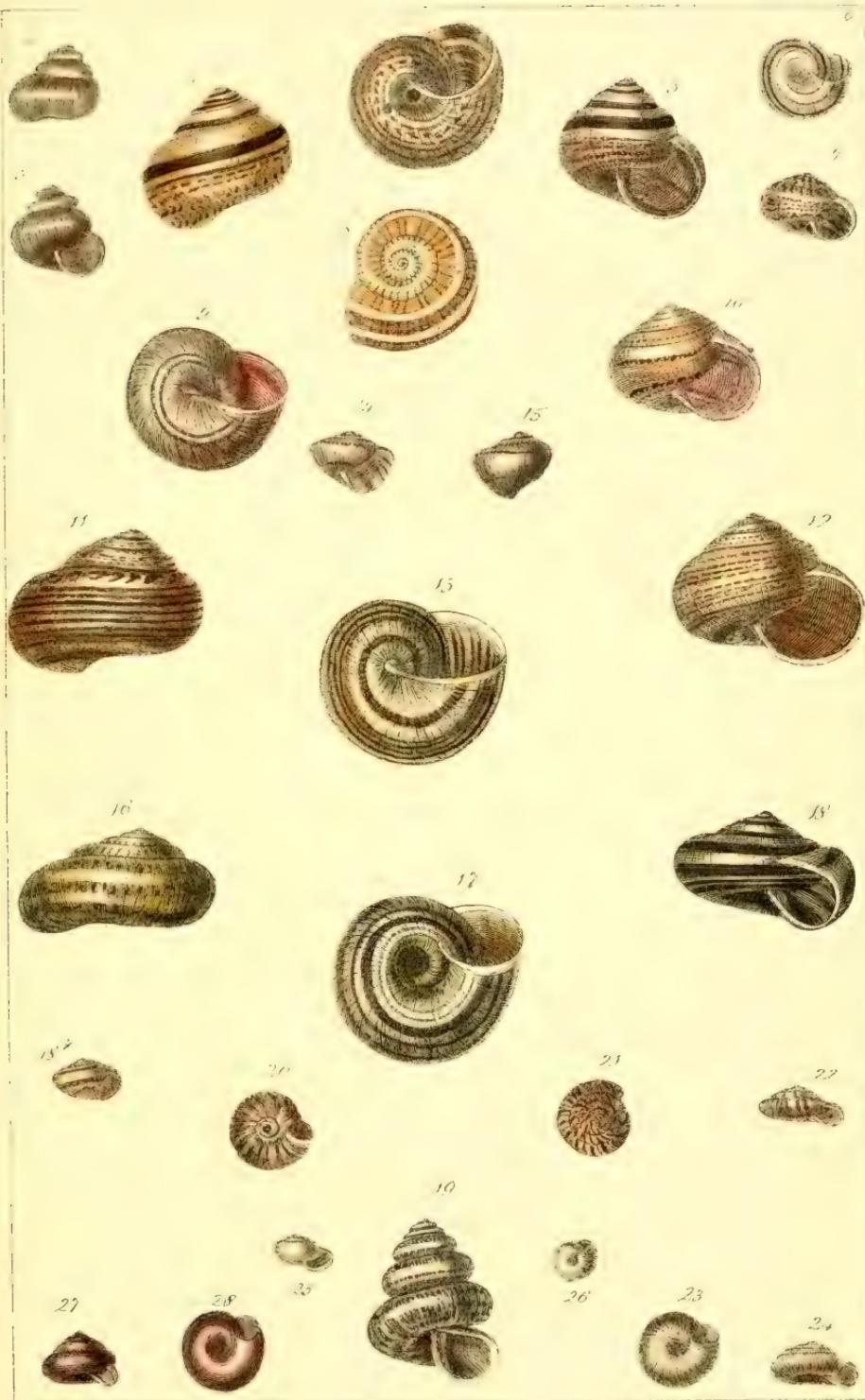






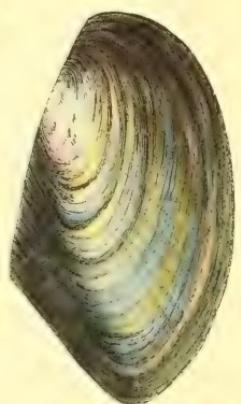


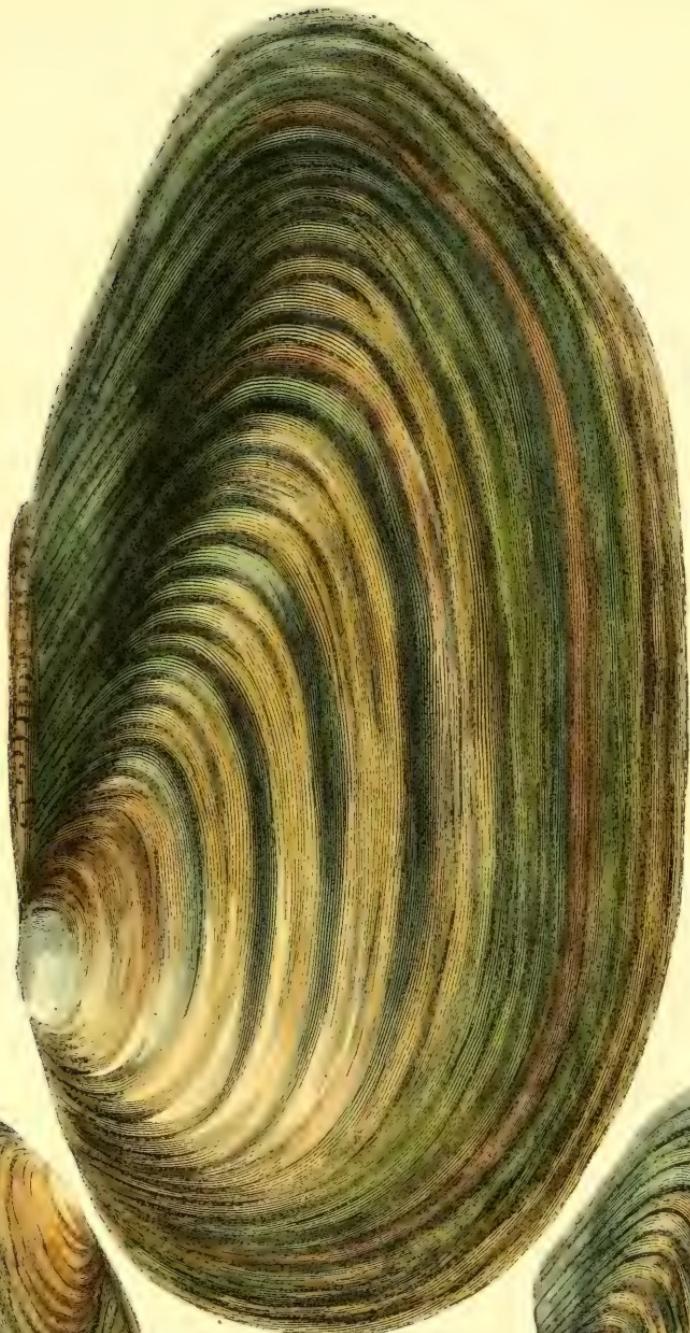








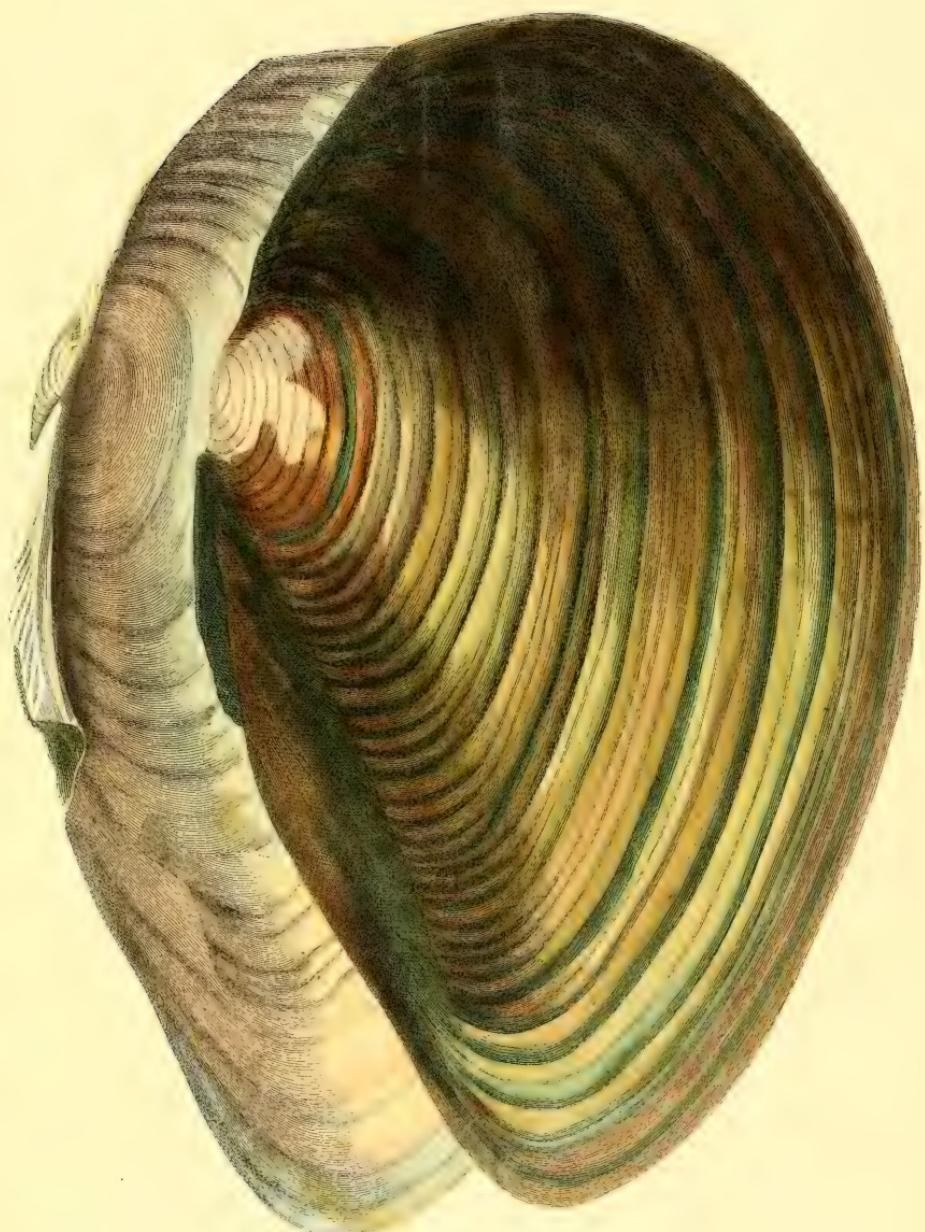


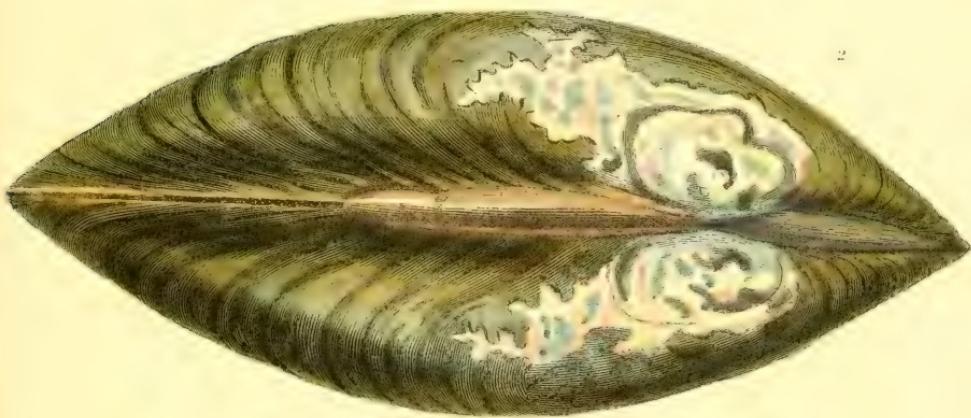


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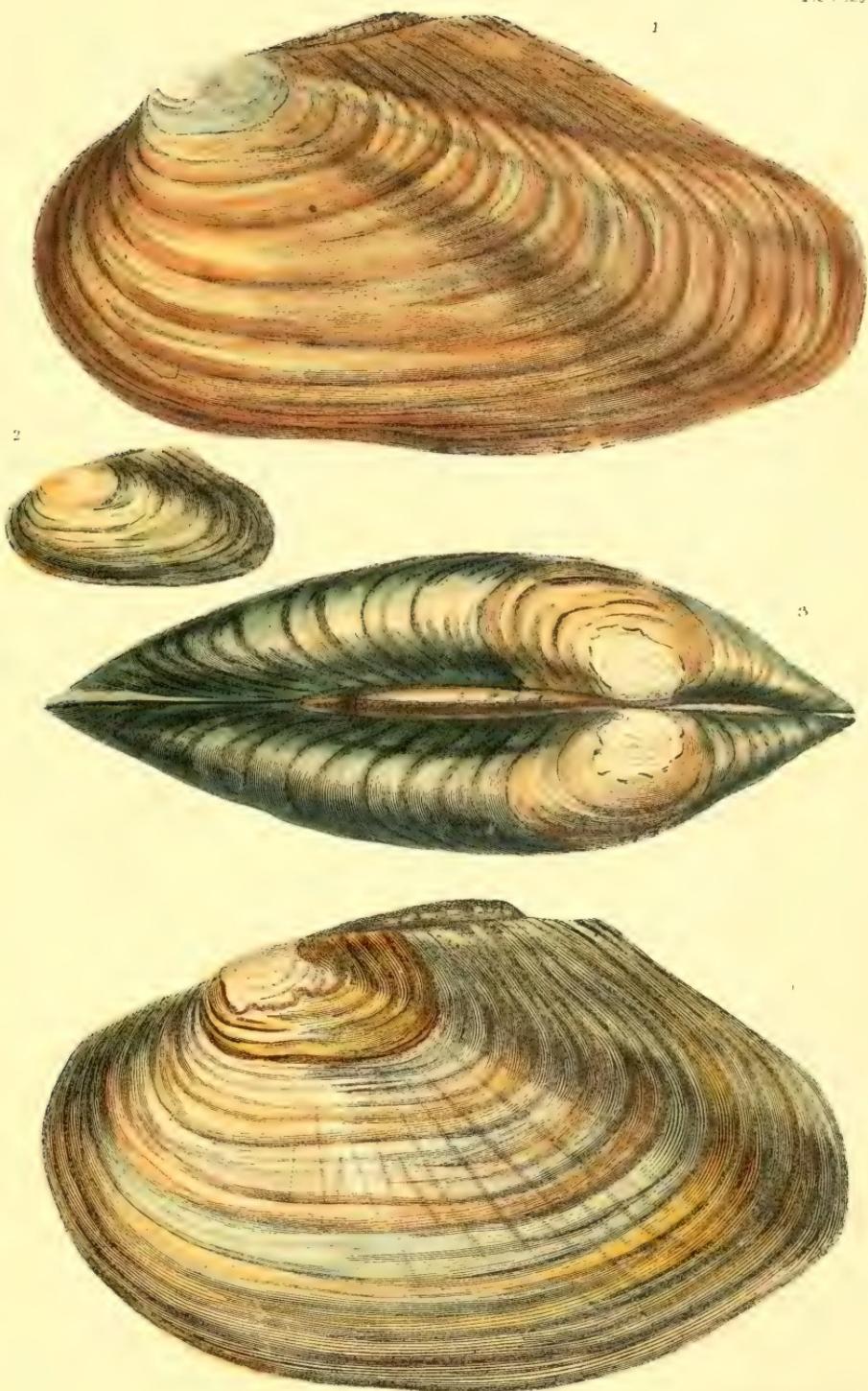


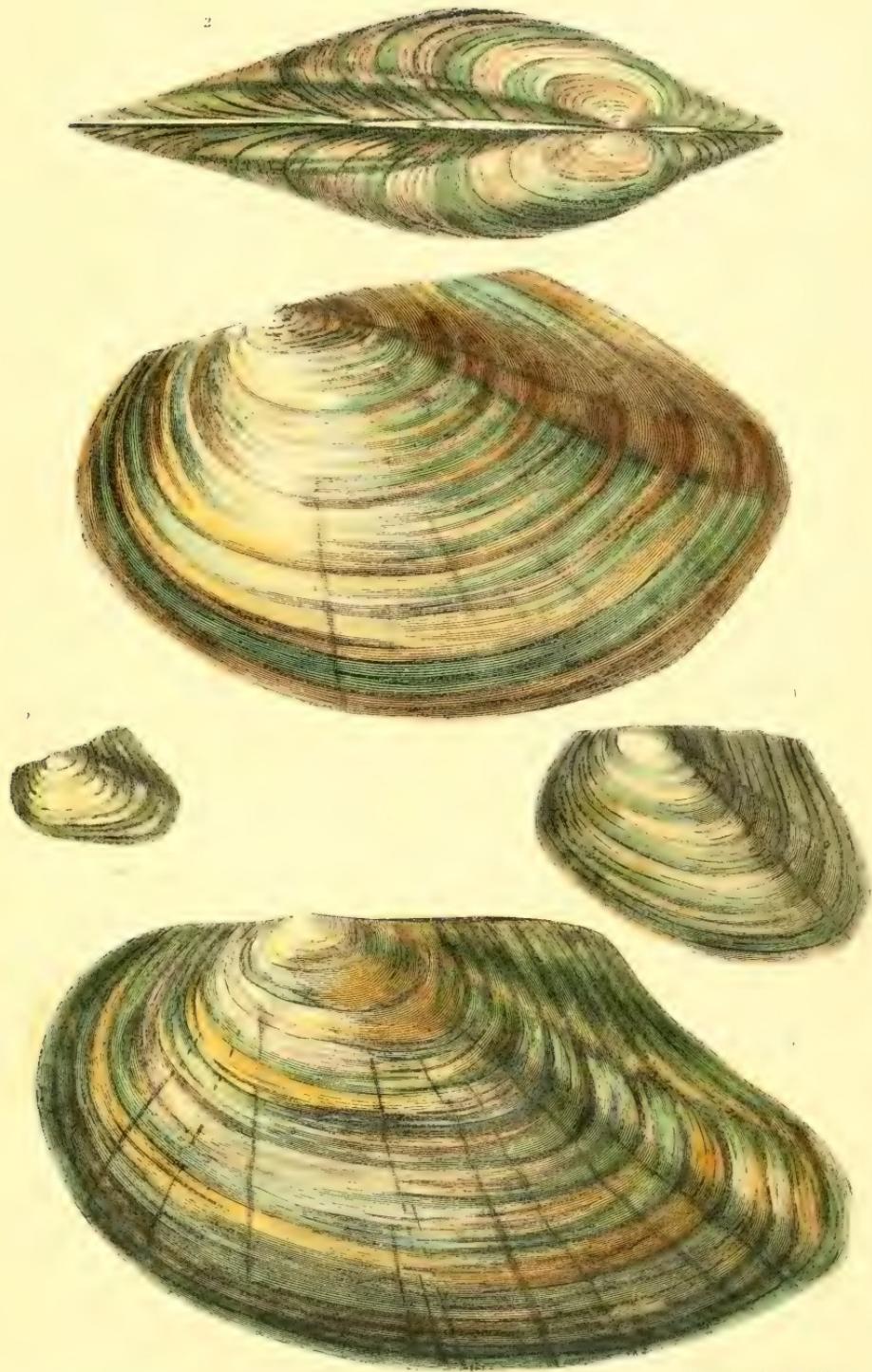




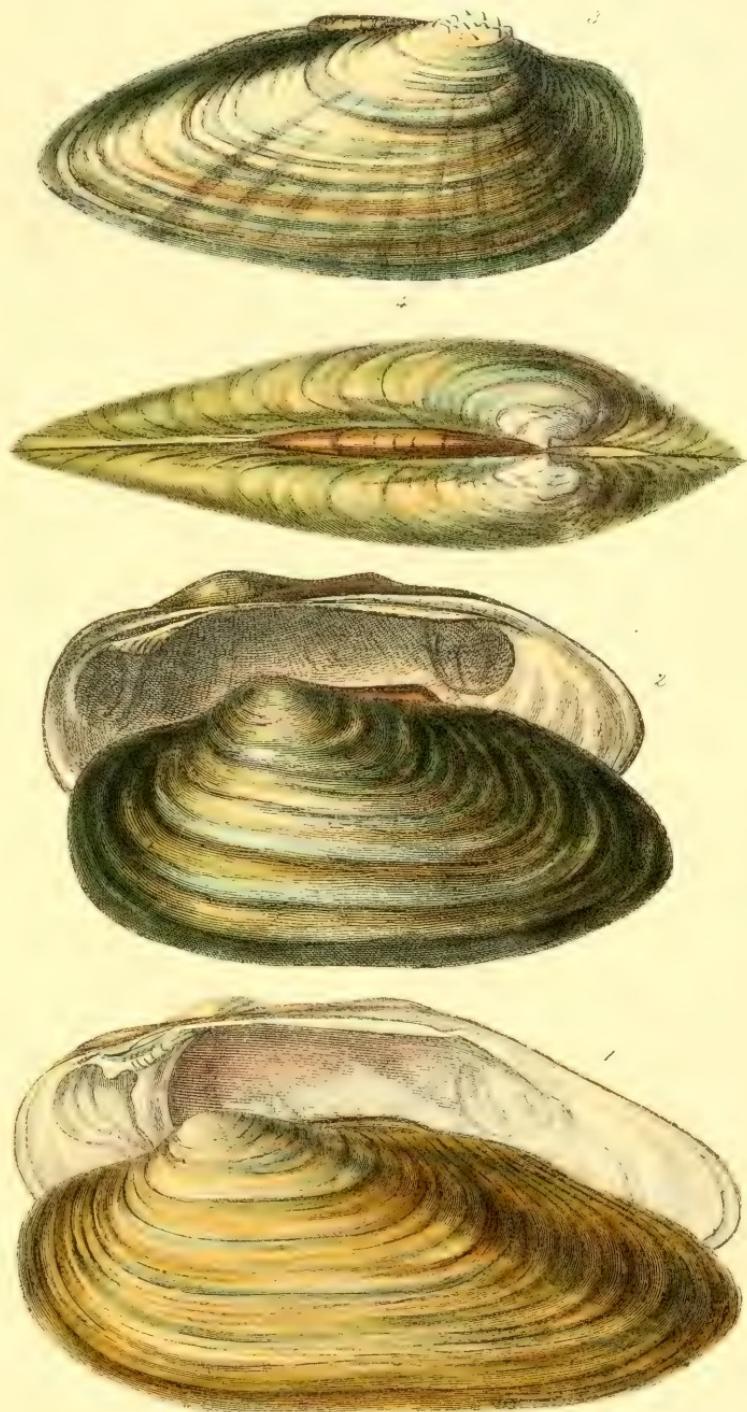


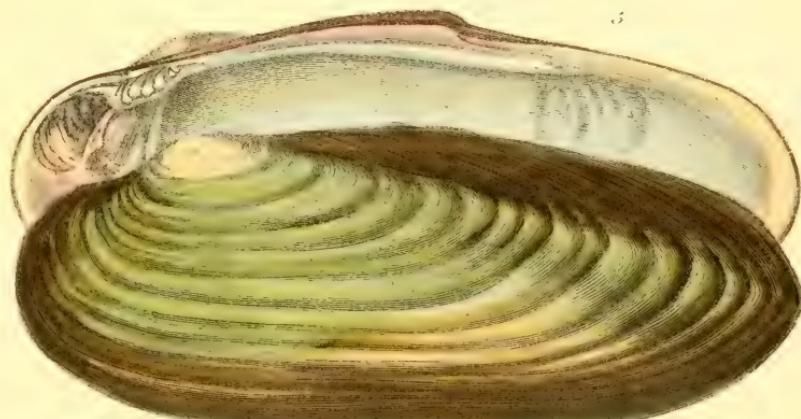
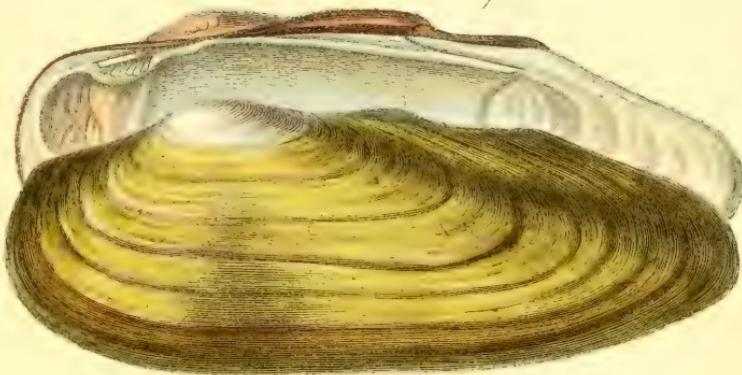




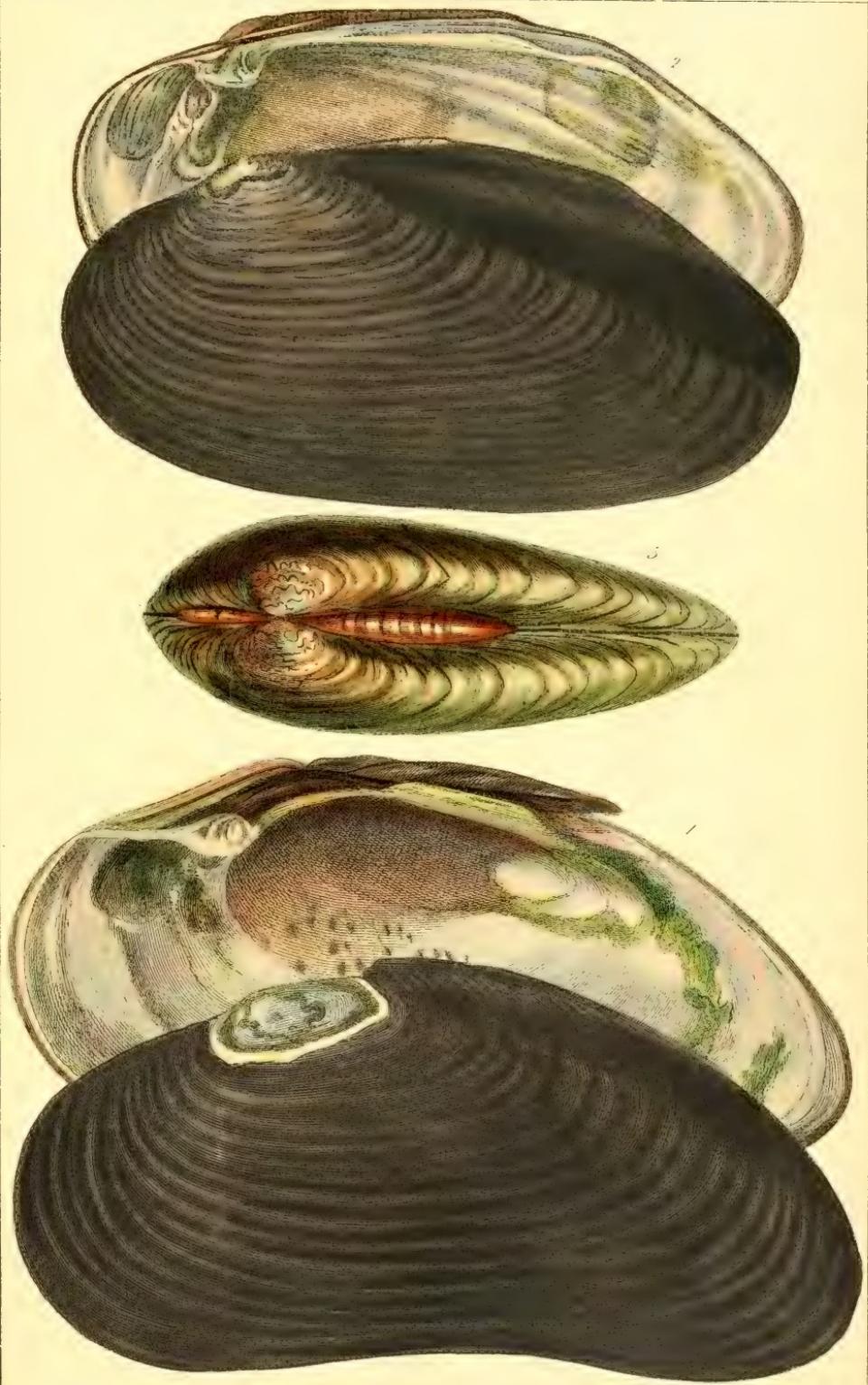




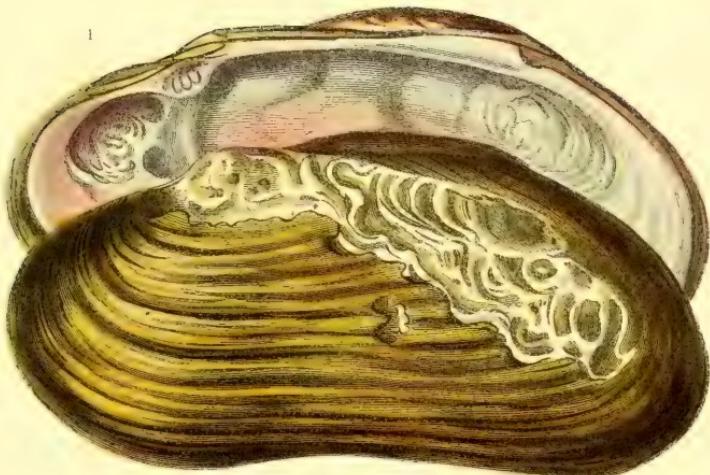








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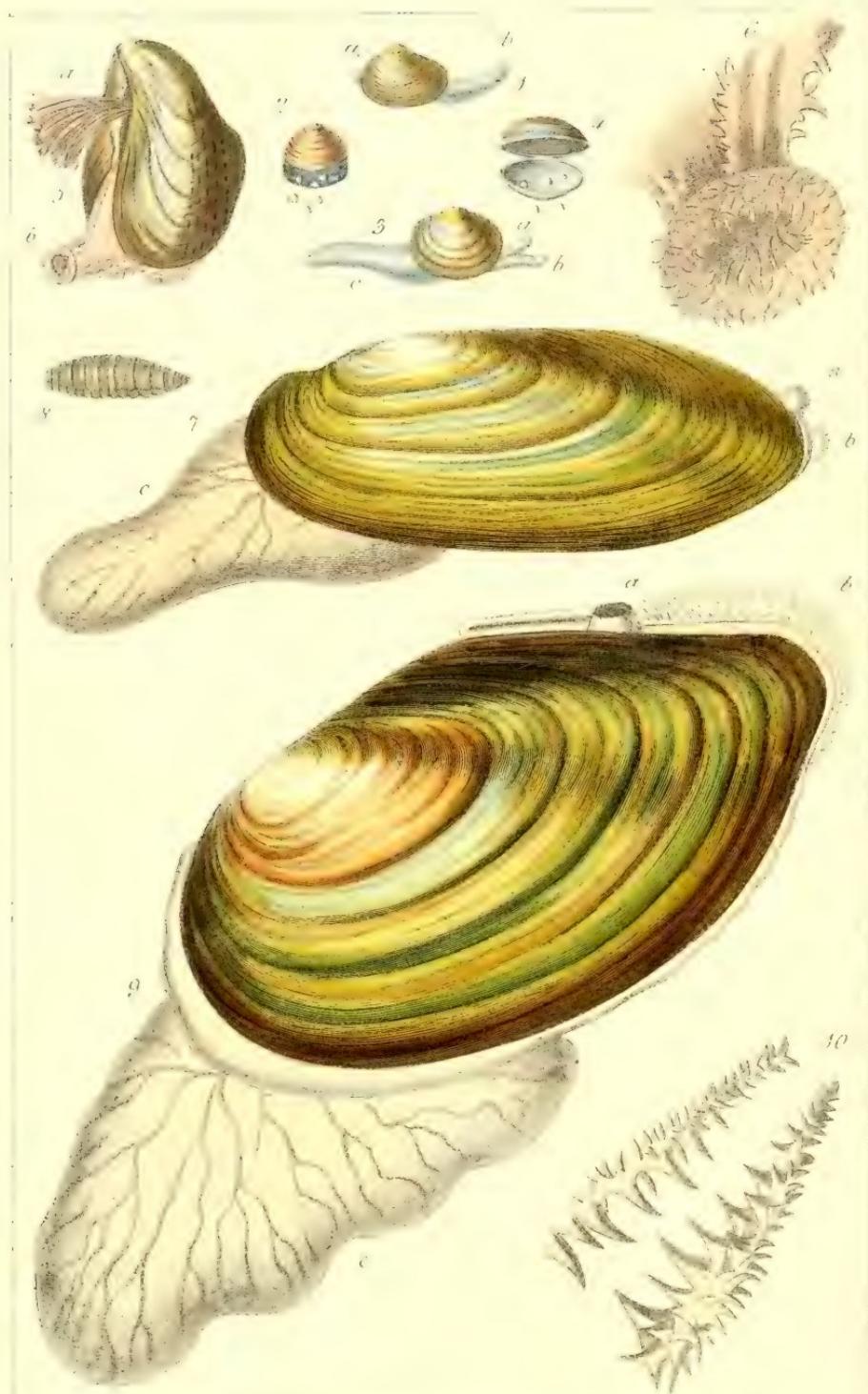






1-12 13-16 17
18-20 21-24









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